THE

PENNSYLVANIA SCHOOL JOURNAL:

AN EDUCATIONAL MAGAZINE.

VOL. XVIII.—No 2. AUGUST, 1869. WHOLE No. 206.

THO. H. BURROWES, *Editor and Publisher.* *Associate*, J. P. McCASKEY.

STATE AGRICULTURAL SOCIETY.

The Pennsylvania State Agricultural Society will hold its next exhibition at HARRISBURG, commencing Tuesday, September 28th, 1869, and to continue four days. For particulars, address the Secretary at Harrisburg.

AMOS E. KAPP, *Pres't.*

D. W. SEILER, *Rec. Sec.*
ELBRIDGE MCCONKEY, *Cor. Sec.*

HON. J. P. WICKERSHAM, State Superintendent of Pennsylvania, has in his possession free return tickets on the Pennsylvania Railroad, for members of the National Association, to meet in Trenton.

PENNSYLVANIA STATE TEACHERS' ASSOCIATION.

Tuesday, August 10th, 1869—Morning Session—10 o'clock.

1. Organization.
2. Opening exercises.
3. Address of welcome, by Rev. J. K. Plitt.
4. Response by the Association.
5. Miscellaneous Business.
6. Inaugural address by the President, Prof. S. S. Jack, Westmoreland county.

Afternoon Session—2 o'clock.

1. *Report.* Mental Philosophy and its relation to the theory of teaching—J. R. Gaff, Chambersburg, Pa.
2. *Report.* State Normal Schools—Prof. I. O. Best, Bloomsburg State Normal School.
3. Discussion of the above report, to be opened by George W. Fetter, Principal Girls' Normal School, Philadelphia, and Prof. S. B. Heiges, York county.
4. Essay. The needs of our public schools—Miss Martha Glass, Pittsburg.
5. Adjournment.

Evening Session—7½ o'clock.

1. Address. Conflict and Reform—Rev. W. C. Falconer, Mercer county.
2. Discussion. Topic to be selected by the Association.
3. Adjournment.

Wednesday, August 11th—Morning Session—9 o'clock.

1. Opening exercises.
2. *Report.* The family school and church as educators of youth—Col. Cornforth, McKean county.
3. Discussion of the above report, to be opened by Amos Row, Esq., of Lancaster, Pa., and Prof. Shumaker, Chambersburg, Pa.
4. Report of committee on absenteeism as related to crime—J. C. Gilchrist, Esq., chairman, Washington county.
5. *Report.* Permanent certificates—S. D. Ingram, Esq., Dauphin county.
6. Discussion of the above report, to be opened by David Evans, Esq., Superintendent of Lancaster county, and J. A. M. Passmore, Esq., Pottsville, Pa.
7. Adjournment.

Afternoon Session—2 o'clock.

1. Address. Civil Government—C. Townsend, New York.
2. *Report.* School attendance—Prof. H. S. Jones, Superintendent of Erie City.
3. Discussion of the above report, to be opened by Miss Maria L. Sandford, Chester county, and T. J. Chapman, Esq., Superintendent of Cambria county.
4. Appointment of committees.
5. Adjournment.

Evening Session—7½ o'clock.

1. Essay. "Stilts"—Miss Jennie Reighard, Williamsport.
2. Address. "Teachers' Inner Life"—Hon. E. E. White, State Superintendent of Ohio.
3. Adjournment.

Thursday, August 12th.—Morning Session—9 o'clock.

1. Opening exercises.
2. Report. Must the classics be abandoned? D. S. Burns, Esq,, Supt., Harrisburg, Pa.

3. Discussion of the above report, to be opened by Geo. J. Luckey, A. M., Supt. Pittsburg, and Prof. Allen, Tioga county.

4. Lecture. Shall common sense sweep away legal cobwebs?—Swinthin Shortledge, A. M., Kennet Square, Pa.

5. Adjournment.

Afternoon Session—2 o'clock.

1. Address. State aid for the course of higher education. Rev. Robt. Audley Brown, D. D., Prest. Westminster College.

2. Report of Committees.

3. Election of officers.

4. Adjournment.

Evening Session—7½ o'clock.

1. Addresses by Hon. J. P. Wickersham, State Superintendent, Hon. Tho. H. Burrowes, Prof. Brooks and others.

2. Report of Committee on Resolutions.

3. Sociable.

4. Adjournment.

The above programme presents a variety of interesting topics. The exercises will be interspersed during the day and evening with vocal and instrumental music, and also with select readings by some of the most prominent elocutionists in the country.

The people of Greensburg are making ample arrangements to give the Association a hearty reception. Ladies will be entertained free of charge, and the hotel rates for gentlemen will range from $1 to $1.50 per day.

A list of railroads favoring the Association is published below.

The local arrangements have been placed in the hands of an efficient committee, with James C. Clark, Esq., of Greensburg, chairman.

No efforts will be spared on the part of the executive committee and the committee at Greensburg to make this meeting one of the largest and most successful that has ever been held, Let there be such a turnout of the teachers of the State as is worthy of the great cause which they represent.

HENRY HOUCK,
Chairman Ex. Com.

RAILROAD ACCOMMODATIONS FOR THE STATE TEACHERS' ASSOCIATION.

The railroad superintendents and general ticket agents have been very liberal, and if the teachers avail themselves of these arrangements, the applications for the same favors next year can be made and received with much better grace. It has sometimes happened that only four or five teachers have passed over any part of some of the railroads. It is hoped that this year the reproach will not be cast upon the officers of the Association, of asking favors for the teachers, which they do not accept. When there is such a unanimous expression of good feeling toward the cause of education on the part of public corporations, let the teachers respond heartily with their presence and energy at the coming meeting.

Free return passes will be issued over the following railroads:

Pennsylvania Central,
Allegheny Valley,
Cumberland Valley,
Delaware, Lackawanna and Western,
East Pennsylvania,
Erie and Pittsburg,
Huntingdon and Broad Top,
Hanover Branch and Gettysburg,
Lehigh Valley,
Lehigh and Susquehanna,
Lackawanna and Bloomsburg,
Northern Central,
North Pennsylvania,
Oil Creek and Allegheny,
Philadelphia and Erie,
Philadelphia and Reading,
Philadelphia and Baltimore Central,
West Chester and Philadelphia.

Excursion tickets will be issued for the Catawissa railroad and Pittsburg and Connellsville railroad. C. H. HARDING, *Secretary.*

STATE TEACHERS' ASSOCIATION.

The annual meeting of this body will commence at Greensburg, in Westmoreland county, this year on Tuesday, August 10, and continue three days. The Executive Committee, we learn, have made the usual arrangements for facilities in travel, and the people of Greensburg are disposed to welcome the Association. The programme of exercises will be found attractive, and, if fully carried out, and in the proper spirit by the members, we look for a beneficial and pleasant meeting. All, however, will depend on those who shall attend. If all meet in the right spirit, and each exert himself to make the occasion what it should be, there can be no failure. For the past three or four years we have noticed that our meetings have been growing in attendance and interest, and this without any extra effort having been made to attract attention. So it should be. The cause itself and the pleasantness of these gatherings, ought to be sufficient to induce every teacher who can afford the time and the small cost of attendance, to be present. We look for this increasing interest and the growing prominence of the profession in the community, to give us a large attendance at Greensburg.

NATIONAL ASSOCIATION.

The educational meetings to be held in Trenton, New Jersey, during the third week in August, promise to be a great success. Three national associations hold their annual meeting there during that week. The Association of State Superintendents meets on Monday, that of Normal School Principals and Teachers on Tuesday, and the general Association of Teachers on Wednesday, Thursday and Friday. For the list of distinguished educational men, by whom lectures or papers have been promised, with subjects to be treated, see July No. of JOURNAL. Let there be a large attendance from Pennsylvania.

PROFESSIONAL TEACHERS.

We see by the official matter in the July *Journal* that the number of permanent certificates issued by the State Superintendent, has reached four hundred and twenty-five, and no doubt an addition will be made this month. We also learn from the same source that forty-five persons this year receive certificates in the several courses at the Normal Schools of Kutztown, Edinboro, and Mansfield, and we are told that thirty-five will be graduated at Millersville. This is doing well. The means devised by the State law of 1867 seem to be now in successful operation and producing good results, and the Normal Schools are beginning to turn out their graduates in very appreciable numbers. So we go. The long watched and much wanted machinery will soon be in full operation, and the permanency and distinct standing of the profession may now be regarded as a certainty. Herein is another motive for faithfulness and exertion on the part of teachers. The higher they rise the more will their defects, as well as their merits, come into view. Let all remember, therefore, that not merely their own reputations depend upon their present discharge of professional duty, but the standing of the profession itself, of which they are the first complete corps brought upon the field of action; and that with them is to some extent involved the final triumph of the system itself.

THE DEPUTY SUPERINTENDENT.

In the well deserved promotion of Mr. Houck to the second office in grade of the School Department, industrious, intelligent and faithful young men will find another instance of the encouragement presented by our institutions to a continuance in well doing. Many think that in achieving such advancement, the successful person is but attaining the object of his previous exertions, and at last bringing all his plans to their desired result. It is not always so. On the contrary, many persons who have long labored to accomplish some coveted official or political promotion, fail of its attainment, and finally discover that sails trimmed for one port, to use the nautical phrase, often bear their bark to another, if not to shipwreck. Whereas, the simple rule of "doing our duty in that condition in life unto which it has pleased God to call us" rarely fails of full and present success therein, and is withal the true road to preferment; for honest merit is not often long overlooked. And such preferment, when it does come, has the double advantage as well as the pleasant feeling of being not only deserved, but within our ability to discharge its duties.

It is with such feelings that we congratulate himself, who has thus merited,—the head of the school department, who has recognized the merit,—and the system itself, which will realize the advantages of Mr. Houck's promotion and higher official action. Another cause of pleasure is found in the fact that the new Deputy is thoroughly a Pennsylvanian, of the good old German stock; and that his appointment will therefore bring the operations and influences of the system still nearer to that important element in our population.

OUR BOOK NOTICES.

The reader will have noticed that a portion of this laborious and responsible editorial duty has for some time fallen upon our Assistant, all not bearing our own initial being his. We call the work responsible as well as laborious, for the reason that it involves not only the labor of reading and closely examining many books that would not otherwise be taken up, but the duty of giving a plain and honest opinion of their respective merits. As this journal is not a puffing machine, and as we judge for ourselves in all cases, irrespectively of the wishes of authors and publishers, the task frequently is not over-pleasant, but as there is also a responsibility to the reader we strive to discharge it to the best of our knowledge.

Our younger Assistant, more ardent and less experienced in life than we, is more easily pleased and indorses with a freer pen: whereas, it may be that we are occasionally somewhat hypercritical. The true medium possibly is between. At any rate, by the agency of both the reader has variety of opinion, and that is a part of "the spice of life."

It has been and will be our practice to look not only at the style, ability and adaptedness to its purpose of each work sent for review, but to add, when merited, a word of approval of its general literary, or moral, or religious tendency, or a caution against its lurking design, if any, when detected. Thus guided, if honestly guided, the reader is all the better prepared for its profitable perusal.

These remarks have been suggested by the notices of two works in the July number,—Wallace's "Malay Archipelago," and Hepworth Dixon's "Her Majesty's Tower," which if written by us would have had a remark added in each case, and these we think so much in place, that they shall even now be made.

The author of the first is a Darwinian, in fact of equal standing and authority as to the "origin of species" as Darwin himself, and, as such, one of those naturalists who follow the facts of science wherever they lead, and who are ready for any conclusion to which that guide may bring them. Learned, moral, and toward revelation very respectful, they are materialists, and their conclusions are to be received with caution—by all who look with confidence for the verification of revelation when true science shall have done its final work. As surely as some of the long doubted facts of Sacred History have been put beyond yea or nay by the labors of investigators from Champollion and Rawlinson to Layard, so surely will those of geology, entomology, and ethnology be all found to agree with God's written word, when all the facts in each place shall have been known and appropriately marshaled. In the meantime, disregarding the hasty hypothesis which seems to assert "four or five progenitors for all animals," and looking for the day when obstacles in the way of believing in the unity of the origin of species shall be removed, we can well enjoy the result of the labors of these learned and earnest but impatient philosophers, and give them credit for the success with which their labors are narrowing down, on their side, the differences between the records of the "stone book" and the "Bible book," and fast removing the "vestiges" of their own theoretical "creation."

As to "Her Majesty's Tower,"—we have read it with interest, and must say that it contains some things that are new, and much that is better told than in any other work within our knowledge. Here is a fuller, plainer and more succinct narrative of the life and fate of Lady Jane Grey, and of her period and event in English history, than the reader will find elsewhere. So as to Sir Walter Raleigh,—though made too much of a hero, perhaps, by the author. But in the whole course of our reading, a more contemptible piece of literary toadyism has not been met than occurs in the title of the book. We have read of "The Tower of London," or "The Tower," all through English history; but that it is "Her Majesty's," is new to us. It did belong to the early kings, and especially to the Roman tyrants, who enlarged it, and with many of their successors used it for the purposes of cruelty and oppression. But for a modern Englishman to tolerate the idea that it now belongs to the reigning monarch, as it did to the ancient tyrants, is disgraceful. It is the "Tower of London," and is no more Queen Victoria's tower, either to alienate, or bequeath, pervert, or abuse, than is the constitutional crown she is permitted to wear.

"SUNDAY, THE FOURTH."

The occurrence of the Fourth of July this year on Sunday, together with the peculiar circumstances of our present position and duties, has led to some thoughts on the subject never suggested before, and to something like a definite conclusion, which the reader shall have for his consideration also.

God ordained the Sabbath for wise purposes—physical, moral, and political, as well as religious. The religious object and use require no remarks, except to say that, with differences to the extent with which it is kept and sanctified, the Sabbath is a Christian institution in every form of Christianity, and in every part of the world where the Christian system is known. Neither is it necessary to say more as to the value, physical and moral, of rest from toil and care at stated intervals frequently occurring, than that the beneficial effect on mind, body, and estate proves the wisdom, the divine origin of the rule. Hygienists, political economists, and moral philosophers alike admit this. Not only is its observance enjoined on and found to be advantageous to each one's self, and to the "son and the daughter," the "man servant, the maid servant," and the "stranger" tarrying with us, but to the "cattle," whose only advantage can be physical and for the owner's benefit.

All this is trite and has been often repeated and amplified by writers of all classes; but the political aspect of the question has been little dwelled on, and to that our present remarks are directed.

Amongst Christians it is admitted that the divine law, of which the Decalogue is the embodiment and synopsis, is binding, everywhere and on all occasions, in its plain, ob-

vious meaning. This needs not to be more than asserted. Ours is a Christian land, and therefore that law, in all its parts, obligatory. Amongst its most solemnly enjoined as well as wisest provisions is that setting apart for rest the one-seventh portion of our time and our lives. Positively and without disaster to our own views of interest or expediency, this command for one day interrupts "all manner of work." Of course, as a general rule, our proper undertakings and employments are to be resumed immediately after these stated interruptions. And here, be it remarked, that all experience shows that these very rests and interruptions but add to the vigor of our subsequent efforts and to the ultimate success of our undertakings. This known and admitted, it by no means hence follows, however, that every thing we would have done on a certain day, had it been a "week-day," should and must be done the next secular day, any more than that we must abstain from every work of necessity on the Sabbath, merely because it is the Sabbath. There is a liberty of limit in both cases, and it will probably appear, on due reflection, that while some work apparently secular may and ought to be so sabbatized, as to be performed on Sunday, and not postponed till the next week-day, so other work, actually secular, must, from the nature of the case and its unjust necessities, be done in a week-day manner on Sunday, to avoid injury to man and beast. In other words, on the first point, some secular employments and occasions ought, when the times for them occur on the Sabbath, to be then performed and observed in a spirit and manner suited to the Sabbath, if admitting thereof, and not postponed till the next, or anticipated on the preceding week-day, being sanctified and observed in a manner suited to the day occurring for them in the ordering of Providence.

On account of the mixed character of the great event of which the Fourth of July is the anniversary, this rule would seem emphatically to apply thereto. Thereby was secured religious as well as political independence; thereby was perpetuated liberty of conscience as well as of body and mind, and, as it now appears by nearly a century of experience, thereby together the cause of religion was promoted as well as the secular rights of man increased. Now, if this be so—we mean that the event had its spiritual as well as its temporal relations and consequences, and who will deny this?—is it not plain that both aspects should be held in mind and celebrated? Yet is it not equally plain that, in the rush and exuberance of our joy over the securement of our civil rights and our national independence, during the week-day celebrations of the Fourth, we lose sight of gratitude for the religious blessings thereby realized but not sufficiently appreciated, if they are not entirely overlooked? In fact, our habitual keeping of the "Fourth" on the third or the fifth of the month, when the Fourth coming on the Sabbath, interrupts this temporal celebration, shows plainly that we regard the day wholly for the temporal advantages it reminds us of. Is this right? Nay, is it not wrong? Can we not devote one Fourth of July out of seven, or rather a score, for the Fourth does not come regularly every seventh year on the Sabbath, to a serious religious celebration of this great anniversary; not grudgingly, to be neutralized by a quasi saturnalia on the third or the fifth, but by unreserved submission to God's ordering of our days and the weeks and months, all of which are in His hands, and every one of which is only rightly spent when passed in accordance with His will? And if it is His will that we observe the great anniversary of our nation and of the leading events in the history of human nature, which we believe, is it not plain that we should, at least occasionally, and when the times come on his Sabbath and in his providence, accept that fact as indicative of our duty as to the occasion and the manner of the observance? So it strikes us; and such we hope may be the conclusion of others when the whole question shall have been duly considered.

Book Notices.

Oral Method With French. *In Three Parts. Part First: Containing 70 easy Oral Lessons, with written exercises, remarks on Pronunciation and notes on Etymology, &c.* 12mo. *Pp.* 180. *Part Second: Containing 50 additional Oral Lessons, with written exercises.* 12mo. *Pp.* 172. *By Professor Jean Gustave Keetel, author of Keetel's New Method. New York: Sheldon & Co.* 1869.

As a general rule we do not like the oral method as the sole means of teaching a new language, for the reason that it gives no knowledge, based on principles, of the true nature of the language attempted to be taught. And we utterly deny the sufficiency of the reason generally given for the adoption of this method to other languages than our own,—viz., "That it is a near approach to the manner in which children learn to speak their mother tongue." As well might we conclude that every child ought to be left-handed, because one child who had lost

his right hand learned to use the left with perfect facility. Children learn their mother tongue sufficiently well by the oral method, for the simple reason that in their case no other is practicable. How can they be taught grammar on the fundamental differences of languages who know no words in any language? The reason is absurd and proves nothing. Still here is a pair of books we like, when used in connection with a proper grammar. It not only gives for oral exercise and also for written, the simple and most frequently used forms of phrase in French, but it compels their pronunciation so often and in so many variations, that the result must be not only a mastery of the pronunciation but a retention of the form of phrase—be it regular according to our English mode, or idiomatic. So of the written exercises. They are so constructed as to fasten the modes of expression on the memory by compelling the mind to think of the principle involved while writing. But again we repeat our protest against reliance upon this—admirable though it be—to teach French or any second language without a regular grammar. B.

THE FIRST BOOK OF ENGLISH GRAMMAR. *Prepared as a Text-Book for Public Schools and for the Primary Classes in High Schools and Academies. By H. D. Walker, A. M., late Principal and Professor of the Theory and Practice of Teaching of the Orangeville Normal School.* 12mo. *Pp.* 261. *Phila.: Claxton, Remsen & Haffelfinger.* 1869.

Here is yet another English grammar, but one based on right principles, if they can be carried into effect. 1. That the teacher shall watch the language of his pupils and correct all inaccuracies in expression. 2. That pupils shall write compositions daily;—in other words, the book is designed and shaped to fulfil Lindley Murray's definition of English grammar—that it is the "art of speaking and writing the language correctly," and not merely of memorizing rules never to be applied. Hence it opens with a wonderfully large list of inaccurate expressions, and every division of the grammer itself compels written compositions, embracing the lingual principle involved therein. Mr. Walker is an old and experienced teacher, a full scholar and a careful observer. We wish his work success, because we think it deserves it. A second book of this series is in preparation. B.

ZELL'S POPULAR ENCYCLOPEDIA AND UNIVERSAL DICTIONARY. *Edited by L. Colange. Monthly part of 5 Nos. No.* 6. *Price* 50 *cents. Philadelphia: T. Ellwood Zell, Publisher.*

No. 6 contains another forty pages of this new Encyclopedia. The articles are numerous and good, but carefully condensed, as must be the case when it is remembered that the design is to compress into the compass of two large quarto volumes what is known of history, biography, geography, science, art, and language, not omitting a comprehensive dictionary of the English tongue. The cost of the Popular Encyclopedia will be less than one-fourth the price of the cheapest now in the market, and the demand for it has already far exceeded the expectations of the publisher.

PRACTICAL C MPOSITION, *with numerous Modes and Exercises, By Mary J. Harper, Packer Collegiate Institution. Brooklyn, New York.* 12. *mo. pp.* 202. *Charles Scribner & Co.*, 1869.

This is a well-planned, carefully composed, and most useful work,—more useful, however, suggestively to the teacher, than practically as a text-book to pupils. Being a very full book, for its size, on its proper subject—English Composition—it necessarily embraces many of the principles and rules of ordinary grammer, with the higher subject of rhetoric As such, it soon soars beyond the mental ken of the child; but always it is practical and useful, and therefore invaluable to the instructor as a manual in his duty of teaching composition. Our own opinion is, the want of success in the so much desired result of making composition interesting and effective in school, arises from the use of mere models, and of requiring pupils to write compositions according to formulas which, though they enabled them to do so with a good degree of correctness, yet do not compel enough of the thought process in the act. It is the teacher, and not the books, that must impart the power to compose, or to think as well as write correctly. B.

HAND BOOK OF MAP DRAWING. *A Hand Book of Map Drawing, adapted especially to the Maps in Mitchell's new Series of Geographies. With twenty-five copper-plate maps, and twenty-five copper-plate construction figures. By Peter Keam and John Mickleborough, Teachers in the Public Schools of Cincinnati. Small quarto. Pp.* 57. *Philadelphia: E. H. Butler & Co.* 1869. *See Advertisement.*

As the book lies open, the map of the region represented is found on the right-hand page, and facing it, on the left-hand page, the simple diagram to which it may be drawn. These diagrams are, of course, arbitrary figures, but they become very useful in fixing the general outline of the country, and in enabling either teacher or pupil to represent that country on paper or on the blackboard previous to indicating the location and relative distances of its natural features or prominent places. There is a world of humbug in our school instruction on "local geography," but this is a common-sense presentation of the subject which strongly commends itself to the notice of the profession. No teacher who believes in free-hand map-drawing can afford to be ignorant of the great merit of this little manual.

A FOURTEEN WEEKS' COURSE IN NATURAL PHILOSOPHY. *By J. Dorman Steele, A. M., Principal of Elmira Free Academy, and author of "A Fourteen Weeks Course in Chemistry and in Astronomy."* 12mo, 317 *Pages. A. S. Barnes & Co., New York*, 1869.

Some months ago we spoke somewhat approvingly of the author's short course in Astronomy, for the reason that the science is so vast as to require a lifetime for its very limited comprehension, yet so necessary to be known in its mere outlines, and so beautiful, regular, and comprehensible in those outlines, that much of them can be learned in a very brief course of instruction, if accompanied with an orrery, or other proper apparatus. But we rather think this author is risking too much, when he proposes to put us through all the sciences by means of a fourteen weeks' course in each. The thing is simply impracticable. Still, as a good elementary treatise to be used and studied for months and years, we can commend the one before us, on Natural Philosophy. It is only to its assumption of being able to teach the science in a few weeks that we object, and against which we would caution. B.

AHN'S NEW PRACTICAL AND EASY METHOD OF LEARNING THE GERMAN LANGUAGE. *With Pronunciation by J. C. Oehlschlager. Revised Edition. First Course: Practical Part. Small* 8vo. 172 *pages. Second Course, or Theoretical Part.* 8vo. 73 *pages. New York: E. Steiger.* 1869.

This combined work of Ahn, with Oehlschlager's system of pronunciation, leaves little to be desired by the student willing to devote himself zealously to the study of German. The first or practical portion is sufficiently on the phrase method to fill the memory with the most ordinary expressions of the language, at the same time

that it largely exercises in pronunciation. It also presents a sufficient series of lessons and passages in German script, to make a writer in the German character. The second, or theoretical, portion is in reality a German grammar, giving the rules and inflections of the language. Together, the parts constitute the best text-book on the subject we have seen; they cannot fail of making a good German scholar, if *both* be used; the one to give the word, the sound and the phrase; and the other to impart the rules and form of structure of the language. B.

HARPER'S PHRASE BOOK; *or, Hand-Book of Travel Talk for Travellers and Schools. Being a Guide to Conversations in English, French, German, and Italian, on a New and Improved Method. Intended to accompany "Harper's Hand-Book for Travellers." By W. Pembroke Fetridge. Assisted by Professors of Heidelberg University. With concise and explicit Rules for the Pronunciation of the different Languages. Square 16 mo. Pp. 309. Flexible Cloth, $1.50. New York: Harper & Brothers.*

Russel, who gets up the Prince of Wales' speeches, declares them "dooced hard writing," the trouble being to make them short enough for the young man to remember. The delightful brevity of everything in this little book would just suit His prospective Majesty. One can get through the world with but a meger vocabulary, if he deals generously in pantomime; and with this well-arranged book to get at the word as needed, and his mother-wit to help him out of inevitable blunders in pronunciation, etc., he must be a dolt that fails to make himself understood in either of the four principal languages here represented.

WOMAN'S SUFFRAGE; THE REFORM AGAINST NATURE. *By Horace Bushnell. 12mo. Pp. 184. New York: Charles Scribner & Co. 1869.*

The name of the author, a fellow student and companion for a brief but pleasant period at Yale Law School 40 years ago, at once caused the reading of this book. Then he was an original thinker and most interesting companion. "By the book" he is still so, though fallen somewhat into quaintness or rather singularity of phrase; but he is always clear, terse, independent, and interesting. Though we differ from him on many collateral dicta and opinions thrown in as elucidations or parallels to his argument, yet we most gladly and fully unite in his conclusion. It is probable that his work would have been more complete and convincing had he dwelt more fully and plainly on the sexual incapacity of women to perform all the duties of man, to which a few of them now aspire, and on the injury thereby to their children. The times and the state of this question demand plain speech. The chapter headed "The Report of History," is exceedingly able; so is that on "the Scripture doctrine," in reference to woman's proper position in society. B.

FIVE ACRES TOO MUCH. *A truthful elucidation of the attractions of the country, and a careful consideration of the question of profit and loss as involved in amateur farming; with much valuable advice and instruction to those about purchasing large or small places in the rural districts. By Robert B. Roosevelt, author of "Game, Fish of North America," etc. 12mo. 296 pages. Cloth, $1.50. New York: Harper & Brothers. 1869.*

Not long ago, some one wrote a very interesting and suggestive work under the title of "Ten Acres Enough,"—to show how much could be produced on a small piece of ground, under proper culture, near a good market. Naturally enough, everything in it was agriculturally and horticulturally *couleur de rose*, and little or nothing allowed for those failures from weather, soil, and mistake, which detract so much from the farmer's and gardener's successes. Here is a very lively and readable book on the other extreme. In fact it is a satire on amateur farming and gardening, with all the mistakes and difficulties of the beginner exaggerated, and the rich amateur shown as the prey, not only of his own ignorance, but of designing hirelings and shrewd dealers. Of course, neither work presents a true picture of the case of properly working a small piece of land to the best advantage; yet a person desirous of practicable hints towards success, will find many of them in "Ten Acres Enough;" while any one wishing to be amused by a graphic account of the inevitable mishaps of ignorance and gullibility, will find in "Five Acres Too Much," occasion for many a smile. B

THE LIFE AND CORRESPONDENCE OF THOMAS ARNOLD, D. D., *late Head-Master of Rugby School, and Regius Professor of Modern History in the University of Oxford. By Arthur Penrhyn Stanley, M. A., Regius Professor of Ecclesiastical History in the University of Oxford. In two vols. 12mo. Vol. 1, 378 pp; vol. 2, 400 pp. Sixth American Edition. Boston: Fields, Osgood & Co. Green Cloth, $3.50.*

In two handsome and portable volumes, beautifully printed, the reader finds here the life and correspondence of the famous head-master of Rugby. The biography proper is from the pen of a former pupil, afterwards associate professor, and always a warm admirer of Dr. Arnold. The numerous letters from the Dr., scattered all through the work, have been selected from his vast correspondence in such manner as to show the divine, the scholar, the teacher and the man. He is thus made, so far as possible, to speak for himself. The object of the narrative has been mainly to link the correspondence together, and thus enable the reader to enter upon the letters with a correct understanding of their writer at his different periods of life, and in his different spheres of action. To read the long chapter on "School Life in Rugby," which occurs in the first volume, may mark an era in the life of more than one teacher. The charm of the whole biography is the intense human element pervading it, elevated and purified by the influences of a devout religious faith and life. To him the relation of instructor to his pupils was like all the other relations of human life, only in a healthy state when subordinate to their common relation to God. "He had the power," says his biographer, "which so many teachers do not possess, of saying what he did mean, and of not saying what he did not mean—the power of doing what was right, and speaking what was true, and thinking what was good, independently of any professional or conventional notions that so to act, speak, or think, was becoming or expedient." Dr. Arnold was a believer in what is now-a-days known as "muscular Christianity," and he it was more than any other man of his time who first gave a broad and wholesome impulse to the thought that it is a sin to neglect the development of any part of man's nature, physical, mental, moral or religious—his influence, too, that has raised up in England the brawny race of Christian scholars, of whom Charles Kingsley and Thomas Hughes may be taken as the type. The law that pervaded his life of labor was "unhasting, unresting diligence." In his social and domestic relations, "he was to his friends as if he had no family; to his family as if he had no friends." In his intercourse with the poor and lowly, there was nothing of condescension; it was always man addressing man. The lively interest which he felt in his old pupils never abated, whether those who had gone up from Rugby to Oxford, or out

into the broader world,—but he was at all times ready with word, or hand or pen, to give advice, encouragement or aid. He was, as the Frenchman would put it, "a grand man," though in a sense nobler than the French expression would convey. As the memory of Horace Mann is revered among educators in our own country, so is that of Dr. Arnold held in veneration in England. This is essentially a teacher's book, but at the same time a work from the reading of which every good, broad man must rise with new strength to labor, and a braver purpose to succeed in the God-appointed work his hands may find to do.

Department of Common Schools.

Department of Common Schools,
Harrisburg, August, 1869.

Official.]

DOCUMENTS RECEIVED.

Journal of Education for June, Quebec, Canada.

Annual Report of the Superintendent of Public Instruction of the State of Kentucky for the year 1868.

Catalogue of Howard University for the years 1868-69.

Annual Report of the Normal, Model, Grammar and Common Schools in Ontario for the year 1867, by the Chief Superintendent of Education.

Annual Report of the Superintendent of Public Instruction of the State of New York for the year 1868.

Prospectus of Swarthmore College for its first school year, 1869-70.

Annual Report of the Public School System of the city of St. Paul, Minnesota.

Catalogue of Doylestown English and Classical Seminary for the year 1869.

Prospectus of Centre County Normal Institute, to commence July 28th.

Catalogue of the officers and students of Wyers' Scientific and Classical Institute, West Chester, Pa.

The Educator for July.

Teachers' Advocate for July.

Teacher of Penmanship for July.

Ohio Educational Monthly for July.

Proceedings of the Teachers' Institute of the City and County of Philadelphia, for the year ending Feb. 19th, 1869.

Journal of Education for April and May, Toronto, Canada.

Catalogue of Albion College, Michigan, for 1868-69.

Annual Report of the Board of Education of the State of Connecticut for 1868.

Programme of Commencement Exercises at Bellevue Institute, Attleboro, Pa.

Seventh Semi-Annual Report on Schools for Freedmen, Jan. 1, 1869.

Catalogue and Circular of Pennsylvania State Normal School, Mansfield, Pa.

Catalogue and Circular of Pennsylvania State Normal School, Bloomsburg, Pa.

Programme of Class Examinations at Lehigh University.

Scientific American for June.

Proceedings of National Teachers' Association for 1868.

Iowa School Journal for June

Journal De L'instruction Publique, Quebec, Canada.

Proceedings of the State Temperance Convention held at Harrisburg, Feb. 23d and 24th, 1869.

Illustrated Catalogue of School Apparatus, Wachob & McDowell, Scranton, Pa.

An Act to establish and maintain a system of Free Common Schools for the State of Arkansas.

Fifteenth Annual Report of the State Commissioner of Common Schools for the State of Ohio for the year 1868.

SUPERINTENDENTS COMMISSIONED.

Since the publication of the list of Superintendents in the last number of the School Journal, commissions have been issued to John Miller, elected City Superintendent of Altoona, on the 15th of June, William A. Lindsay, of Cumberland county, Rufus Lucore, of Elk county, S. F. Rohrer, of Forest county, Hiram Winters, of Fulton county, Ira Harsh, of Mercer county, Jere Fruttchey, of Monroe county, and John Layton of Pike county.

The question of the Superintendency still remains undecided in Wyoming.

PERMANENT CERTIFICATES GRANTED.

No.	Name.	Residence.	
426	Thomas N. Neill....	Pittsburgh, Allegheny	Co.
427	B. W. Lacey.....	Mauch Chunk, Carbon	"
428	M. J. Corse.....	" " "	"
429	Anthony Beers.....	Audenried P. O., "	"
430	Osborn Knecht.....	Summerhill P. O., "	"
431	Sadie E. Guthrie.....	Strattonville P. O., Clarion	"
432	Mattie J. Callen.....	Clarion " "	"
433	Kate J. Berryhill....	Jersey Shore, Lycoming	"
434	Mary S. Toner.....	" " "	"
435	Hannah A. Boyle....	Blairsville, Indiana	"
436	S. G. Boyd.....	York, York	"
437	C. C. Taylor.....	Lundy's Lane, Erie	"
438	Annie E. Wilcox....	Pittsburgh, Allegheny	"
439	Kate Reese.....	Fillmore P. O., Centre	"
440	Jennie S. Givler.....	Middle Spring, Cumber'd	"
441	L. M. Sterrett.....	McConnellsburg, Fulton	"
442	Jacob S. Smith.....	Green Castle, Franklin	"
443	John Brewer.....	Stroudsburg, Monroe	"
444	Leah A. Eakin.....	Wesley, Venango	"
445	James B. Torrey....	Bethany, Wayne	"
446	Henry Hubley.....	Spring Forge, York	"
447	Mary A. McGrew....	Mummasburg, Adams	"
448	Martha A. Warren..	Gettysburg, "	"
449	Michael Kauffman...	Indiana, Indiana	"
450	Maggie Walkinshaw	Saltsburg, "	"

CONTESTED ELECTIONS.

Objections to commissioning the superintendents elected on the 4th of May last arose in the following counties: Blair, Bucks, Butler, Cameron, Crawford, Cumberland, Dauphin, Elk, Erie, Forest, Fulton, Indiana, Luzerne, Lycoming, Mercer, Monroe, Pike, Wayne and Wyoming.

In Bucks, Butler, Crawford, Dauphin, Luzerne and Wayne, the objections were of an informal character; and, although they received respectful consideration, they were not deemed of sufficient importance to cause much delay in the issuing of the commissions. In Lycoming, although not made in the manner required by law, the objections came in such a shape as to demand answers and explanations on the part of the superintendent elect. These were promptly given by him, and are now on file in the Department. They were thought to furnish ground sufficiently safe upon which to issue a commission, and this was accordingly done.

The gentlemen elected in the counties of Blair, Erie, Indiana and Mercer, did not furnish the conventions that elected them with the evidence of competency to fill the office required by law. Before they could be commissioned, therefore, it became necessary for them to present the required evidence to this Department. This evidence was presented in every case named, and is now on file; and there being no longer any reason for withholding them, the commissions were issued

The superintendents elected in the counties of Elk and Wyoming not being able to furnish the necessary documentary evidence of qualifications, appeared by appointment for examination at the rooms of this Department, on Wednesday, June 16th. The following report shows with what result:

REPORT OF COMMITTEE.

HARRISBURG, June 16th, 1869.

Hon. J. P. WICKERSHAM,
Superintendent Common Schools.

SIR: The undersigned, appointed a committee to examine persons elected superintendents on the fourth of May last, whose qualifications as stated in their certificates of election are not such as the law requires, have, in accordance with the duty devolved upon them by their appointment, carefully examined George H. Walmsley of the county of Elk, and Samuel Sickler of the county of Wyoming, and they respectfully report that they do not consider either of them qualified to receive a county professional certificate, and that therefore they consider them legally unqualified to hold the office to which they have been elected.

Very respectfully,
Your obedient servants,
HENRY HOUCK, } *Committee.*
S. B. HEIGES, }

Having witnessed the examination of George Walmsley and Saml. H. Sickler, I concur in the conclusion arrived at by the above committee. J. P. WICKERSHAM,
Supt, Com. Schools.

The superintendents elected in the counties of Fulton and Monroe were in the same position as regards evidence of qualifications, as the superintendents of Elk and Wyoming, but they were unwilling to submit to an examination, and consequently surrendered their claims to the office.

In Elk county, Rufus Lucore having received the next to the highest vote in the convention, and having all the qualifications made necessary by law, was duly commissioned. In Wyoming, E. L. Underwood received the next to the highest vote in the convention, but objections have been duly filed against him, and the question of his being commissioned remains unsettled. In Fulton county, Mr. Winters, the old superintendent, has been commissioned, no objections being filed against him in time to prevent it. In Monroe, Jere Fruttchey having received the next to the highest vote in the convention, was duly commissioned.

More serious difficulty was met in deciding the contested cases in Cameron, Cumberland, Forest, and Pike, and the following are the written opinions given respecting them:

OPINION IN THE CAMERON COUNTY CASE.

DEPARTMENT OF COMMON SCHOOLS, }
HARRISBURG, June 17, 1869. }

In the matter of the objections to the issue of a commission to Joseph B. Johnson, as County Superintendent of the county of Cameron, and to the salary voted him by the convention of Directors, held May 4th, made by J. A. Wykoff and others, and filed June 2d, 1869.

The general charge in reference to Mr. Johnson is that he is unqualified for the office of County Superintendent, on account of a want of "literary and scientific acquirements, and skill and experience in the art of teaching."

The charge in reference to salary is that the vote by which it was fixed, was taken by the directors rising and being counted, and not *viva voce*.

There are seven school districts in Cameron county, and objections of the kind herein referred to, must therefore be made among others, by the majority of the members of at least two boards of directors, and be certified to under oath or affirmation by at least three of the objectors.

The petitions containing the above-mentioned charges appear on their face to be signed by the proper number of directors, and to be sworn to by the proper number of persons;

but it is proven by the affidavit of D. B. Polen, of Gibson, a member of the board, that only three directors of that district signed the petition; and by the affidavit of D. R. Nelson, of Independent district, also a member of the board, that it was signed by only three directors of that district. As five directors in Grove district signed the petition, it was signed by more individual directors than the law requires, but they do not constitute a majority of any two boards. The charges are therefore not presented in such a shape that they can be considered, and they are hereby dismissed. And as the certificate of election has been made out by the officers of the convention according to law and to the rules of this Department, a commisssion will be issued to Mr. Johnson at once, and he will be allowed the salary voted him by a majority of the directors present. To avoid all misapprehension, however, it will be added that the mode adopted at the convention for fixing the salary of the Superintendent is subject to grave objections, if it is not altogether illegal, and it should be avoided in the future.

Cameron county is small in extent of territory, and contains but twenty-five schools. The whole State appropriation divided among the districts of the county for the school year, 1868, was only $203.58, and for the present year it is only $449.00. The salary of the County Superintendent, as fixed by the recent convention, is $1000 per annum, thus largely exceeding the whole State appropriation to the county.

If salaries in like proportion had been voted to all the Superintendents in the State, the aggregate amount would be nearly $600,000, $100,000 more than the whole amount appropriated by the Legislature for the support of common schools.

It cannot for a moment be supposed that the Legislature intended to grant unlimited power to conventions of school directors to take money out of the State Treasury.

If the present law contains no remedy for a state of things like that in the county of Cameron, or a much worse state of things which may occur hereafter in any county, it is time a new one was enacted better guarded.

J. P. Wickersham,
Supt. Com. Schools.

OPINION IN THE CUMBERLAND CO. CASE.

Department of Common Schools,
Harrisburg, June 17, 1869.

In the matter of the objections to the issue of a commission to George W. Swartz, as County Superintendent of the county of Cumberland, made by George W. Haldeman and others, and filed May 27th, 1869.

The facts in this case are substantially as follows: The convention of directors to elect a County Superintendent, met at Carlisle, May 4th, 1869, and having duly organized, several ballotings took place without resulting in an election. Finally all the candidates but two informally withdrew, and the ballot stood 56 for George W. Swartz, 55 for D. E. Kast, and one director, although known to be present, refused to vote, not desiring the election of either of these gentlemen. The President of the convention then declared Mr. Swartz elected, but when objections to his decision were made and the law relating to the election of County Superintendents was read, he refused to decide the question, stating that the matter would be left in the hands of the State Superintendent, and the convention adjourned in considerable confusion. Subsequently a certificate of election was received at the School Department, signed by John C. Kirk, President and J. C. McCune and George W. Haldeman, Secretaries of the Convention, in which they certify that "George Swartz, whose address is Boiling Springs, was *declared* elected, *vice voce*, by a majority of the members *voting*."

On the 27th of May, a petition was received by the State Superintendent, signed or purporting to be signed by twenty-nine directors of the county, charging, first, that the election of George W. Swartz was illegal, and second, that he is incompetent to discharge properly the duties of the office. A protest against the commissioning of Mr. Swartz was also received from five of the directors of Dickinson district, but without making any specific charge against him.

A hearing was accorded to parties interested at the rooms of the School Department, on Tuesday, June 15, when, it appearing that the directors signing the petition containing the charges had not in scarcely any case designated the districts in which they lived, and consequently rendered it impossible to determine whether they represented a majority of one-fifth of all the boards in the county or otherwise, and that the charges made were not supported by the affidavits of any of the persons making them, no action could be taken upon the objections made, and they were dismissed. This being the case, all the argument presented with reference to the legality or illegality of Mr. Swartz's election was wholly unnecessary, for in the absence of objections made by directors, according to the act of Assembly, which

provides the mode of making such objections, the State Superintendent is not competent to adjudicate a question of that character. It is held that unless objections be made in a legal way to so doing, a State Superintendent must commission any person having the requisite qualifications of a literary, moral and professional character, who receives a certificate of election, legal in matter and form, from a properly constituted convention of directors.

A much more serious question, however, remains to be considered. It concerns the certificate of election presented by the officers of the convention. Is it such a certificate as the law requires? Is it a certificate of election at all? Can any one determine from it who was elected County Superintendent of Cumberland county, or whether any legal election took place?

In determining this question, it is not, as before intimated, considered within the province of the State Superintendent of his own motion, to make inquiry into the matter of the legality of the election of Mr. Swartz. This could have been done only in case objections to the issue of a commission to him had been made according to law, by a majority of at least one-fifth of all the boards of directors in the county, accompanied by the necessary number of affidavits.

The question is, therefore, narrowed down to this: first, is the certificate of election received in the case of Mr. Swartz such as the law requires? and second, if not, can the State Superintendent issue a commission based upon it?

That this certificate of election is not such a one as the law requires, appears from the following considerations:

1. It does not contain the matter it is required by law to contain. Section CIII, Digest of School Laws for 1866, requires County Superintendents to be "selected *viva voce* by a majority of the whole number of directors *present*," but the certificate of election in Cumberland county substitutes the phrase "elected *viva voce* by a majority of the directors *voting*." Section CIII, digest of the same date as above, provides that it shall be the duty of the president and secretary of the triennial convention of directors to certify to the Superintendent of common schools, the name and post office address of the person elected county superintendent, in pursuance of the provisions of the act. but the officers of the convention aforesaid say, not that Mr. Swartz was elected, but that he "was declared elected."

2. It is not in the form prescribed by the School Department. The prescribed form of a certificate of the election of a County Superintendent contains the matter made by law essential to the character of such a certificate, but this form seems to have been purposely changed to correspond with the facts designed to be reported. This change would not perhaps invalidate the certificate, if it contained the matter required by law, but as it is, it weighs against its validity.

3. It is not designed to be a legal certificate. The secretaries of the convention were of the opinion that Mr. Swartz had not been legally elected. The President simply "declared" him elected, and said the question concerning the validity of the election might be decided by the State Superintendent. The expression used in the certificate, signed by both the President and the two secretaries, "declared elected" instead of "elected," as found in both the law and the form of certificate prescribed by the School Department, shows that their design was, not to certify to the positive fact of Mr. Swartz's election, but rather to communicate their opinion that he had not been elected. Mr. Kirk, the President of the convention, in an affidavit since taken, says, in substance, that while at first he declared Mr. Swartz elected and believed such to be the case, he afterwards, upon hearing the law read, changed his decision and refused to decide the question one way or the other. He also swears "that in signing this certificate of election, made out by the secretaries, who had expressed the opinion in the convention that Mr. Swartz was not legally elected, I did not consider that I was certifying positively to the election of Mr. Swartz, as I would have done had no objections been raised, and no doubt existed in my own mind in reference to the validity of that election, but my intention in signing it was simply to communicate the exact facts of the case to the State Superintendent for his decision."

From these considerations it is evident that the certificate of Mr. Swartz's election is not only not such a one as the law requires, but that it denies, by implication at least, the very facts that ought to be certified to in such a certificate.

As the certificate of Mr. Swartz's election is not such a one as the law requires, can the Superintendent of Common Schools issue a commission based upon it? If no certificate of election had been received, of course no commission could have been issued; as one was received which, while it purports to be a certificate of election, fails to certify to, even if it does not deny, the essential facts required by law to be contained in such a certificate, it is my opinion that any commission based upon

it would be invalid. I therefore decline to issue a commission to George W. Swartz as county superintendent of the county of Cumberland; and as the vacancy thus occurring cannot be filled, for the same reason as given in the case of Mr. Swartz, by commissioning D. E. Kast, who received next to the highest vote, it will be filled according to law by appointment.

J. P. WICKERSHAM,
Supt. Common Schools.

At the hearing the objectors appeared in their own behalf, and Lemuel Todd, Esq., of Carlisle, appeared as counsel for the respondent.

The vacancy in Cumberland county has been filled by the appointment of Wm. A. Lindsay.

The opinions in the Forest and Pike county cases will be published next month.

ITEMS FROM REPORTS FOR JUNE AND JULY.

BEAVER.—Progress is being made toward the establishment of a Normal School in this Normal District. The schools of the county are closed, with one or two exceptions.

BLAIR.—There are but two or three public schools now in operation. The examinations of teachers will begin about the 10th of August.

CAMERON.—A wing twenty-eight feet by 36, two stories high is now being built to the school building in Emporium.

COLUMBIA.—A great deal of interest was manifested at the County Institute, though the membership was not as large as last year.

ERIE.—The directors of Albion borough have erected an elegant two story house at a cost of $5000. The rooms are well supplied with good furniture and apparatus. The summer term opened the first Monday in June.

ERIE CITY.—The interest on the part of parents and pupils was encouraging during the month of June. Members of the *first* graduating class of the High School received their Diplomas. The Diploma was given only to those pupils who passed through the course of studies, and embraced attendance, deportment, &c.

JUNIATA.—No schools are now in operation. The Juniata County Normal School, in charge of Mr. A. Baum and the County Superintendent, at Thompsontown, closed its first session of eleven weeks on June 18th. One hundred and one pupils were in attendance during the session, twenty-five of whom were teachers, or who are preparing to teach the coming term.

LANCASTER.—The examination of teachers for the city is over. There was a general improvement on the part of applicants. The schools also did well during the year.

LYCOMING.—Fully one-fifth of the districts have schools in operation now by subscription. Some districts have now a three months' summer term of public schools. Susquehanna will, in a few days, commence a ten months' term.

NORTHAMPTON.—William H. Hunsberger, a highly gifted and faithful young teacher has been called from the scenes of his earthly labors. All the schools are closed, and teachers and pupils are enjoying their vacation. A number of Normal School graduates have applied for situations in our county.

PERRY.—The directors of Marysville borough are building a new frame school-house. Buffalo township will have a new school-house.

SCHUYLKILL.—Teaching is being looked upon as one of the professions, and is made so through the liberality of our directors. The directors have increased the salaries of their teachers from 10 to 25 per cent, as follows:

Mahanoy City Borough.—Borough Superintendent, from $75 to $90 per month; High School teachers from $65 to $75; Grammar from $60 to $70; female teachers' salaries in proportion. Term ten months.

Ashland Borough.—Superintendent from $75 to $100 per month; High School from $65 to $90; Grammar from $60 to $75; females from $35 to $45. Term ten months. Schuylkill is now the third county in the State in paying salaries to teachers. We intend soon to be the first.

SCRANTON.—The grounds around three buildings were inclosed and improved. Number of pupils attending school:

On roll, males....946	Average..766	per ct..81
" " females...998	" ...754	" ..76
1944	1620	78

SULLIVAN.—Extracts from the Sullivan county *Democrat*, on Superintendents' salaries:

In this county the directors expect work of their Superintendent, and so far have not been disappointed. When the law creating the office of County Superintendent went into effect, there were not ten native teachers in the county who were competent to fill that office; we have now fully one hundred. The entire value of school property in this county at that time would not exceed one thousand dollars. Now it will exceed eighteen thousand. We can now point to as large a number of well built houses as can be found in any section of the State where the means of its inhabitants are so limited. Then a tax of five mills on a dollar was regarded as oppressive. The School Boards now assess and collect three times that amount, and see that it is judiciously expended in the education of our children, instead of being wasted in paying inefficient teachers.

We were fortunate in selecting a man as our first Superintendent who cared enough for the advancement of the educational interests of our county to spend more days than he received dollars compensation for his services. Our directors have not failed to appreciate that kind of service, hence the almost unanimous voice of each succeeding convention that our Superintendents were too poorly paid for services required of them.

Surely the compensation of a Superintendent who, in addition to the other duties of the office, travels over a country of 430 square miles in extent, to visit sixty schools, should not be less than that paid for the care of the same number of schools in our large towns, where the time in passing from one school to another forms but a trifle in proportion to the amount of labor necessary for the work in a county like Sullivan.

Our State Legislature set us a very commendable example in increasing the salary of our State Superintendent, from eighteen to twenty-five hundred dollars. That the directors should give a corresponding increase to the salary of County Superintendents shows a corresponding disposition to see that the compensation of the school superintendency is sufficient to induce men of ability to remain in the discharge of the duties of that office.

WILKESBARRE.—From the report of the Superintendent of Common Schools, we extract the following. Schools kept open 10 months; whole number of pupils, 943; males 387, females 456; average per centage of attendance, 70; number of teachers, 18; schools in three departments. The average scholarship of the entire schools reached 8 out of 10, the highest mark.

The report reviews at length the operations of the schools during the year; pointing out some defects, and urgently inviting the co-operation of parents and friends of education in making them still more efficient.

WASHINGTON.—A select school for boys and girls, at Claysville, will commence on Monday, the 9th of August, 1869.

ORIGINAL COMMUNICATIONS.

CLASSIFICATION OF NOUNS.

BY T. R. VICKROY, A. M.

Language, whether spoken or written, is the embodiment of mental acts in words. "It is not the dress of thought; it is its living expression." The mind is informed not only through its perceptive and intuitive powers, but also through its representative and reflective faculties. The senses acquaint us with the world of matter, and reason unveils the truths and realities which underlie material existences. The representative power reproduces the ideas thus acquired, and the discursive power elaborates them into finished systems. Isolated perceptions and intuitions are combined into new concepts, which constitute the elements of our thoughts, so that the words which we use represent not only objects but also cognitions. In the definition and classification of the noun this fact should not be forgotten. Several concepts may be combined so as to originate a new idea and require a new word for its expression. Words are therefore representative, and express moral, intellectual and esthetical ideas.

A noun is generally said to be "the name of an object," and however varied the expression, the import of the definition is the same. To define an object as anything which we can see, hear, touch, taste, smell, or think of, renders this definition too comprehensive. Adjectives are names of qualities of things which we can see and feel, such as color and hardness, and verbs designate such physical things as actions of various kinds. The term noun is the name of one of the general classes into which we divide English words, and is therefore generic, embodying only those conceptions which are common to each species of nouns. To the class noun we refer every word which designates entities, wholes, or anything regarded as a distinct part. This definition excludes adjectives and includes abstract and verbal nouns, and has the characteristics of truth, self-evidence, distinctness, adequateness and separateness. A pupil will recognize a noun as soon, if not sooner, by the correct trait of its representing something as a whole or a distinct part, as by the loose definition of its being a *name*. The qualities of thought attach to words, and hence if we would attain just conclusions we must conform our definitions and classifications to fixed principles.

There has been much discussion as to whether *person*, *number*, *gender* and *case* should be called properties, accidents or modifications. That which pertains to anything is its property, and that which *expresses* an accidental quality is a modification.

The so-called properties of words are only so many cross-divisions, and arise from classifying according to different categories of thought. Nouns and pronouns designate entities, things considered as wholes or distinct parts, whether objects or cognitions, and from the quantity, quality and relations of these the various classes originate. Quantity may be considered as to *extensiveness* or *manifoldness*. If a noun designate a particular person or place it is called a proper noun. If it represent a class of similar objects it is a common noun. If it designate parts as constituting an organized whole it is a collective noun. If the word expresses a quality or condition without reference to any particular object it is denominated an abstract noun, and if it designate an action without reference to a subject, it is a verbal noun. Thus the species of nouns depends upon the *extensiveness* of quantity. From the *manifoldness* of quantity we obtain the grammatical property of number. If the word designate but one object, or express a conception which involves unity, it is singular; if it designate more than one object, or express a conception which involves plurality, it is plural. The grammatical number of a word, therefore, does not depend upon its form but upon what it represents.

The category of quality gives us *gender* or *kind*. The English language was evolved from Anglo-Saxon and Norman-French elements. In Anglo-Saxon there were three genders, masculine, feminine and neuter, which did not depend upon the nature of the object represented, but upon seemingly arbitrary principles. In

French there were but two genders, masculine and feminine, and hence when Norman-French and Anglo-Saxon intermingled, confusion and the consequent obliteration of all arbitrary distinctions resulted. In Anglo-Saxon *tooth* was masculine, *sin* feminine, and *wife* neuter. In French *dent* (tooth) is feminine, *peche* (sin) is masculine, and *epouse* (wife) is feminine.

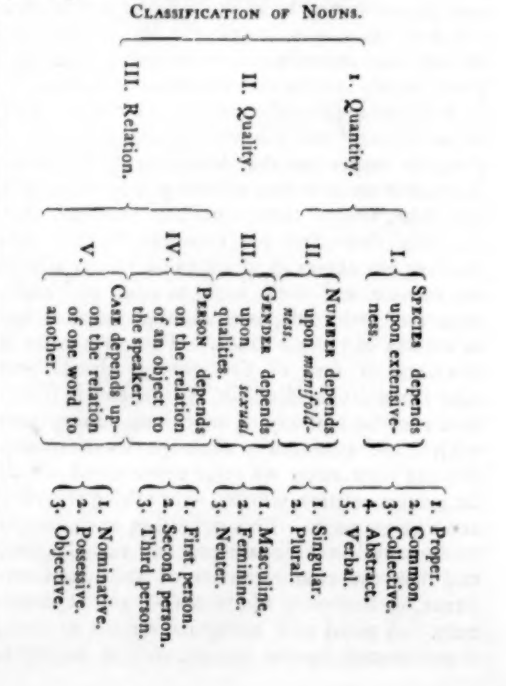
Hence it is comparatively easy to learn the gender of English nouns, since nouns representing objects without sex are masculine or feminine only when such qualities are attributed to them, In all other cases the nature of the object determines the gender.

Upon relation depend *person* and *case*. *Person* results from the relation which the speaker sustains to the object represented. If a noun or pronoun represent a person as speaking, it is of the first person. If it represent the person addressed, it is of the second person; and a noun or pronoun representing a person or thing as something spoken of, is of the third person. Thus, in the sentence, "Am I my brother's keeper?" *I* and *keeper* represent the same person (Cain); but *I* designates him *as speaking*, while *keeper* refers to him as spoken of, and hence is of the third person. So in the sentence, "Jesus said unto them, 'When ye have lifted up the Son of Man, then shall ye know that I am he.'" *Them* and *ye*, and also *I* and *he*, represent the same objects respectively, but are in different persons, owing to the relation these words sustain to the speaker.

But not only the things of which words are the signs are objects of thought, but the words themselves sustain a certain sentential relation to one another. From this relation arises Case. There has been much discussion as to the nature of this grammatical category. Covell, Kerl, and Greene regard case as the relation of a word, while Brown and Burtt regard it as a modification of form. The latter says: "Case is a modification of the noun to distinguish its relation to other words," meaning by modification, "a change in its form." Subsequently, however, he confounds form and relation. Kerl, in language as clear as it is erroneous, says: "The relation of an object to what is said of it, is case." Greene says: "Case denotes the *relation* of a noun or pronoun to other words," and then defines the nominative case as "the simplest *form* of the *noun*." If it be *form*, it is not *relation;* and if it be relation, it is not form. From the above definitions we cannot determine whether it be case or relation. If case were relation, then there should be as many cases as nouns have relations. But this is not the fact. Latin nouns have six cases; Greek, five; while German and Anglo-Saxon have but four. What we mean when we say that a noun has a certain number of cases, is that it has so many forms.

English nouns have but two forms to express relation to other words, while a few of the pronouns have three such forms. Like neuter nouns in Latin and Greek, the Anglo-Saxon has one form, at least in some nouns, for the nominative and accusative singular, and another for the nominative and accusative plural. Thus, for the sake of uniformity as well as for other reasons, three cases are ascribed to English nouns, although there are but two distinct forms in each number. As we may use pronouns in nearly all the positions in which nouns are employed, this fiction of an objective case for English nouns simplifies our rules of syntax, and accords with the analogies of comparative grammar. Whenever an English word varies in form, we determine its relation by the sense and also by its position, and hence say that the word must have such and such a form on account of this relation. In this particular the difference between an English and a Latin sentence fully appears. We "parse a Latin sentence in order to understand it, but we must understand an English sentence in order to parse it." Hence, case is the form a word takes in view of its construction, which form depends upon the relation of one word to another.

Below we present a tabular view of the principles elucidated in this article:



SELECTIONS FROM EXCHANGES.

PROFESSIONAL TRAINING.

Among the many things which have passed from the realms of doubt or ridicule into the category of established and immutable truths is the proposition that teaching is a science, and the teacher an artist. Over the growth and development of every plant and leaf and flower and fruit, of every organic body, animate or inanimate, in the whole material universe, God has thrown the regency of his everlasting laws, saying to the inquiring soul of man everywhere, "See how they grow." And no sublimer discovery has rewarded the investigation of the ages than that the spirit itself of man, the subtle, wonderful, deathless *knowing and thinking powers* of the soul, are in the grasp of laws equally harmonious, changeless, and inexorable. If right culture gives strength and majesty to the tree, grace and beauty to the flower, symmetry, health, and power to the animal; while wrong treatment gives weakness, deformity, and disease,—as surely do the growths of the mind respond, in nature and value, to the kind of nurture which they receive. Go to the gardens, the orchards, and the herds of the wise and skillful, and then to those of the ignorant and slovenly, and see, contrast, reflect, and be convinced. Come with me to the school-rooms where Wisdom opens the beautiful gates of knowledge; where one by one charmed groups are lead onward by gentle hands, and upward by the sure and easy gradients which God himself has hewn for young feet in their ascent toward himself; where, through outward forms of visible and tangible things, so full of interest and beauty, and so profusely strewn on every hand, the mind unconsciously rises to the upper level of conceptions and thoughts, to the grasp of ideas as well as of material things; where, all the way, the clear sunlight of appropriate, attainable, and definite knowledge beams steadily upon each day's lessons, and sweet, glad inspirations refresh the heart and make buoyant the steps, till the years of school life are ended, and the State receives back her children, keen, alert, observant, intelligent, knowing something of books, but more of things, joyous, in sympathy with the facts and problems of nature and of being, and ready for the battle of life. Come with me, again, to other school-rooms, where the cold sterilities of text books are the alpha and omega of instruction,—to whose teachers the mental powers of the pupils are an unknown and inexplicable tangle, under no fixed laws of prior and sequential activity and growth, and hence to be plied at random with whatever comes first to hand, the simple or compound, the abstract or concrete, the objective or subjective alike, where preception, conception, reflection, imagination, and memory, and all their shining sisters of the mind are supposed to be of synchronous birth and development, growing simultaneously and *pari passu*, like the fingers and toes, and like them to be all, without distinction, forced into one mental glove or boot; where words, words, words are the stones fed to little ones starving for the living bread of things, facts, realities; where verbal definitions, utterly meaningless to those who repeat them, are substituted for the quick, clear, sharp, definite knowledge afforded by the eye, the ear, or the hand; where the weary hours of school-life drag heavily and joylessly along, till the end comes, when they take their books home, and begin the active duties of life, for which they are little better fitted than before.

Compare these schools, teachers and results, and measure, if you can, the difference in the kind, amount, and value of the returns which they make to the State that provides for and fosters them all alike. I repeat, teaching is a science, and the teacher is an artist; and the more thoroughly the principles of that science are understood, and the skilful practice of that art acquired, the better will be the quality of the work performed. If teaching is a science, its principles may be stated, defined, and mastered, the same as those of any other science; if it is also an art, skill, dexterity, and success may be obtained in the practice of that art the same as in any other. This is an obvious, common-sense view of the matter. If the premises are granted, the facts and results must be as stated above. And the premises cannot be denied; they have ceased to be challenged, throughout the educational world. It is utterly impossible to account for the rich and blessed fruits of the teaching in some schools, and the lamentable barrenness of that in others, except on the hypothesis that teaching is a science to be learned, and an art to be acquired, and that in the former case the schools are taught by competent professional teachers, while in the latter case the teachers are ignorant both of the science and art pertaining to their profession. The two classes of schools which I have attempted to sketch are not the deductions of theory, or drawn by the imagination; the

originals of the pictures, substantially, may be found in all portions of the State. At present there are fewer of the first class than of the second, but we hope for more and more of them.

Not that all teachers are capable of achieving equal success, even with the same advantages of professional training; that is impossible in any human pursuit. There are persons whom no amount or kind of training can make successful teachers, and who should therefore never seek to enter the profession. The number of such persons is, indeed, greater than is generally supposed. It is simply claimed that special preparation is as essential for the work of teaching, as for any other important and difficult human pursuit; and that such preparation will do as much for the educator as a like preparation will do for the members of any other profession; that no man is born a teacher, any more than a lawyer or an engineer; and that, other things being equal, he who, by careful study and special preparation, is master of the theory and art of teaching, will always and everywhere, and of logical necessity, be incomparably superior to him who has had no such advantages.

Hon. Newton Bateman.

LAFAYETTE COLLEGE,

One of the noblest uses to which wealth can be put is the endowment of our colleges and universities. It is only by such means that the higher education can be brought within reach of the masses. No fees for tuition, however great the number of students, can support the learned Faculties of instruction, and provide suitable buildings, with all the necessary appliances of libraries, apparatus, and scientfic collections. It is complimentary to the American character that we are so often called upon to chronicle the munificent gifts made by our countrymen to increase the efficiency of our various institutions of learning, and Philadelphia, the home of Franklin, and of some of the most eminent philosophers and savans of the present day, numbers also among her citizens, men of large and liberal views, whose wealth is freely devoted to the advancement of science.

Among the benefactions recently made for this object, is the gift, by Mr. John A. Brown, of twenty thousand dollars to Lafayette College. Mr. Brown is one of our oldest and most respected citizens. His unostentatious gifts have from year to year enriched the treasuries of the charitable associations of this city, and now he has crowned a long and honored life by this munificent gift in the interest of a broad and liberal culture for American youth. For this noble act he deserves and will receive the thanks of all wise and good men.

Lafayette College, to which this donation has been made, is rapidly becoming one of the most important educational centres of our country. Founded over forty years ago, and always characterized by the distinguished ability of its instructors, and the large proportion of its graduates who have become eminent in the various professions, it nevertheless does not seem, until recently, to have attracted any large share of public attention. At the accession of Dr. Cattell to the Presidency, about four years since, the whole number of students was fifty-one; the catalogue for the present year, recently sent us, shows that the Freshman Class alone numbers fifty-eight. The Faculty of Instruction now consists, as we also learn from the catalogue, of sixteen professors and two tutors, and the curriculum of studies has been enlarged by adding to the old classical course a parallel scientific course, which includes all the studies of the Classical, except Greek and Latin, for which is substituted the philological study of modern languages, especially our own. Besides these two courses for the undergraduates, embracing the usual period of four years, there is a third course designed for those who wish to pursue studies essentially practical or technical, and this is divided into three departments, viz.: engineering, mining, and metallurgy and practical chemistry. It is needless for us to dwell upon the manifold advantages offered by this choice of studies, ranging from the broad culture of the classics to the most thorough special training necessary to prepare experienced engineers and miners, and practical experts in the application of chemistry to agriculture and the arts.

President Cattell's administration has also been signalized by the erection of several important buildings, among them an astronomical observatory, and one of the most complete chemical halls in the country. The apparatus, cabinets and library have also been greatly enlarged, so that every facility is afforded the learned Professors for imparting instruction to the large and increasing number of students in the various departments of study.

It is gratifying to know that nearly all of the funds for these improvements have been furnished by Pennsylvanians. Dr. Traill Green, of Easton, erected the observatory at his own cost. The department of Chemistry was wholly organized by two gentlemen of this city, Mr. William Adamson having endowed the Chair in the sum of thirty thousand

dollars, and Col. B. H. Jenks having built the laboratories for about the same sum. J. H. Scranton, Esq., of Scranton, and Mr. Thomas Beaver, of Danville, having been large contributors to the endowment fund. But the most munificent patron of the College is Mr. A. Pardee, of Hazelton, whose gifts to it during the last three years, have amounted to about two hundred thousand dollars. This record of what has been done for one College alone is highly creditable to Pennsylvania, and shows that our citizens appreciate the value of the higher education, not only for those about to enter the professions of law, theology, and medicine, but for all those who are fitting themselves for mercantile life, and for those scientific professions which, in this land of abounding mineral wealth, are becoming more and more important to the full development of our resources.—*Philadelphia Evening Bulletin.*

ARCTIC AND ANTARCTIC OCEANS.

Among the navigators and scientific men of former times, it was disputed whether salt water was capable of being frozen. Experience—in many cases a stern teacher—has set that question at rest, proving that within the polar circles the sea is, for hundreds of miles, covered with masses of ice, which form a sullen, unyielding barrier to the poles. Maury describes the agencies at work in these terrible solitudes in a famous passage: "There icebergs are framed and glaciers launched; there the tides have their cradle, the whales their nursery; there the winds complete their circuits, and the currents of the sea their round in the wonderful system of oceanic circulation; there the aurora is lighted up, and the trembling needle brought to rest; and there, too, in the mazes of that mystic circle, terrestrial forces of occult power and of vast influence upon the well-being of man are continually at play. Within the arctic circle are the pole of the winds and the pole of the cold; the pole of the earth and of the magnet. It is a circle of mysteries; and the desire to enter it—to explore its untrodden wastes and secret chambers, and to study its physical aspects—has grown into a longing."

Marine ice is whitish, opaque, and rough on the surface, and consists of thin flakes of a porous spongy texture. From the quantity of strong brine enclosed in its substance, it is very heavy and dense, and projects only one-fifth above water. When sea water begins to freeze, it partially deposits its salt, which, thus set free, retards the process of congelation below. Old floes are almost fresh, but a thaw renders them brackish. The polar seas do not congeal until the temperature falls to 28½ degrees of Fahrenheit, which takes place in September in the north, and March in the south; though even in summer, a slight increase of cold is sufficient to form young ice several inches thick. The sun sets early in November, and the severity of the arctic winter begins in December, continuing to the end of January, during which time the thermometer ranges to about 40 degrees below zero. A week or two of milder weather comes on; but the middle of February brings with it the sun, immediately followed by the most intense cold of the whole winter. After that the sun's influence begins to be felt. And in July the ice breaks up. During the three summer months the sun never sets, but noon and midnight are equally illumined by brilliant sunshine. A few stars appear in September. The darkest part of the winter is from the middle of December to the middle of January, when the aurora transforms the sky into a vault of fire, and paraselenæ appear, surrounding the moon with blazing crosses, circles, and mockmoons, scarcely surpassed by the wonderful deceptions of the solar rays. The intense cold of February is accompanied by considerable twilight, and in the latitude of Bank's Land there is even at the end of January tolerable light from 9.30 A. M. to 2.30 P. M., so much so, that at noon Arcturus is the sole star unquenched by the increasing daylight. The only navigable time is from July to September within the northern, and January, February, and part of March within the southern circle. During the rest of the year, the arctic regions are impenetrably sealed by vast fields of ice, both "floe" and "pack" covering every foot of water, from the shallowest inlet to the wide expanse of Baffin's Bay or Melville Sound.

The interior of Greenland is occupied by vast glaciers which encroach on the coast, filling the deep dark fiords with frozen snow. As summer advances, those portions of the glacier that project into the sea are undermined by the waves, and fall with tremendous noise, rocking in the foaming waters until they gain equilibrium, when, perfect icebergs, they float here and there, impelled by winds and currents. Many are borne by the polar current southward. They meet the warm waters of the Gulf-stream in latitude 50 degrees, where they melt, and deposit the loads of earth and stones borrowed from the Greenland soil. According to Maury, this has probably, in course of time, formed the Grand Bank of Newfoundland. They are in incredible numbers. As many as five hundred have been counted in sight together, ranging

from fifty to three hundred feet in height, and of all sizes up to a mile in extent. Their appearance is very beautiful and no less extraordinary. Gothic churches, Egyptian temples, aerial palaces with pillars and arched windows festooned with crystal draperies, are only some of the inconceivable varieties of form displayed, while they gleam under the summer sun like mountains of burnished silver, with pinnacles and cliffs of clear sapphire or the palest green, from which rush cataracts of limpid water mingled with fragments of ice. These various hues arise from several causes. Bergs are originally composed of fresh water ice of different ages, but that formed from salt water frequently overlies it in parts. A great deal of snow lies on their summits, and forms large ponds of fresh water, when dissolved by the heat of the sun. Finally, the solar rays touch the bergs with color, changing with the position of the spectator. Only one-eighth of their total thickness is seen above water. Frequently bergs capsize in consequence of the sea undermining their base. An ominous rolling motion gives notice of this event; it continues for some time, and at last the berg heels over and disappears with a terrific plunge, sending up columns of spray. It reappears bottom upwards, balances itself, and floats on with a changed face.

All the antarctic land just discovered consists of gigantic cliffs without a single opening, three thousand feet high in some places, descending in others to one hundred feet. The whole is faced with ice of enormous thickness, and covered with snow, so that at a glance the eye can scarcely imagine it to be land at all, but for spots showing the dark stone where the cliff is too perpendicular to admit of even ice maintaining its hold. Nothing is so tenacious as the cold of the antarctic regions. In February, the warmest summer month of 1841, the thermometer never rose above 14 degrees at noon near the continent. It is rarely above 30 degrees in the sun at mid-day during summer, and falls in winter more than 50 degrees below zero. The sun stays a week longer north of the equator than it does south, making the winter and night of the antarctic regions longer. South Georgia, in a latitude corresponding with that of Yorkshire in the northern hemisphere, is always covered with frozen snow, and produces scarcely anything but mosses and lichens. The immense preponderance of water south of latitude 50 degrees, allows the fierce westerly winds to blow round and round the world, a perpetual cyclone, keeping the sea in constant agitation.

The two polar circles differ greatly in physical conditions. The antarctic has a marine climate, that is to say, it is equable. Though wet and stormy it is not subject to extremes of temperature, and it is believed that the south pole must be warmer than the north in winter. Arctic sunshine raises the thermometer to 66 or 70 degrees, and hung in the shade immediately after the mercury falls to the freezing point. The arctic climate is continental—dry, calm, and variable. The thermometer has a range of about 120 degrees; and when the round of the seasons brings but little change in the frightful antarctic wastes, nothing can surpass the beauty of the arctic summer—"an endless blaze of light, the air, sea and earth teeming with life," plains glowing with richly tinted flowers, and strange, glittering forms sailing past "in stately and solemn procession." Its currents are strong, and bear large numbers of bergs to meet the warm Gulf water, and as it is natural to suppose, bergs are found to be most numerous where the drift is strongest. The antarctic seas are in direct opposition to this. Not only are its currents sluggish and feeble, but the most powerful of them, Humboldt's current, carries few bergs along the Chilian coast, while the main icedrift is towards the Falklands on one side, and the Cape of Good Hope on the other, where there is scarcely any motion of the water. This is a fact which no navigators are able to explain, except perhaps on the supposition that there may be strong submarine currents at a great depth below the surface. Bergs have been observed in Baffin's Bay drifting rapidly to the north, where there was a powerful surface current running against them, showing that in consequence of their weight and immense draft of water (in some instances more than a thousand feet,) they must be influenced by some "resistless undertow" yet stronger.

Chambers' Journal.

THE SUN.

In these days nothing escapes the eager and pereistent glance of science. During the solar eclipse of 1860, peculiar rose-colored protuberances were seen darting like flames to a great elevation above the sun's surface. These appearances caused astronomers to look forward with the greatest interest to the eclipse of 1868. It was known that this eclipse would be total for a period of seven minutes—a duration that would not occur again for centuries. That this unusual opportunity might not be lost, parties of observation were stationed at several points on the line of totality, reaching from Arabia to Malacca. The photographic and

spectroscopic instruments employed by these expeditions were of the utmost delicacy, and in spite of troubles from drifting clouds very important results were obtained.

The protuberances were readily seen, in some cases of remarkable height, estimated at from twelve thousand to ninety thousand miles, but rapidly changing in shape and extent as the sun moved on from station to station. M. Janssen describes one of these appearances as resembling the flame of a vast forge urged by a powerful blast through the openings in a combustible mass. Another he likens to a group of snowy mountain-peaks, resting on the limb of the moon and illuminated by a setting sun.

On applying the spectroscope to these protuberances, their nature was at once made manifest. Various bright lines, separated by intervals of darkness, met the eye of the observer. No result could be clearer. They were plainly masses of luminous vapor, volumes of flaming gas leaping strongly upward from the surface of the sun.

The number of these lines varied very much in the different instruments, Lieutenant Herschel seeing but three, while Janssen saw five, aud M. Rayet no less than nine, of which only one was unknown, the others agreeing with prominent solar lines. The presence of hydrogen and magnesium was plainly indicated, with unknown elements, among which carbon may possibly have been present.

Thirty years ago it was known that the light of the edge differed from that of the body of the sun, and it was then conjectured that a peculiar solar envelope might exist. The discovery of solar protuberances lent force to this conjecture, and two years ago Mr. Lockyer conceived the idea of directing his glass to the edge of the sun, and in this manner isolating the light of these strange masses. It was only in October last, after the date of the eclipse observations, that he succeeded in realizing his idea, and producing in his instrument two distinct spectra—one the ordinary solar spectrum, the other a spectrum of colored lines, as above described.

Meanwhile, during his observations of the eclipse, M. Janssen conceived the same idea, and on trying the sun with his spectroscope the very next morning, plainly beheld the bright lines of the protuberances in the edge of the solar disk.

This important discovery will obviate the necessity of awaiting the fleeting event of an eclipse for a continuance of these observations, and will, moreover, afford the useful test of an ordinary solar spectrum placed in direct comparison with the new bright lines. It has already served to disprove the presence of sodium, which was indicated in the eclipse observations. Lockyer, by his new process, has already arrived at the following interesting conclusions: He finds reason to believe that the sun is surrounded by a gaseous envelope of great regularity, alike in equatorial and polar regions, and nearly five thousand miles high. The protuberances seem to be temporary ebullitions of gas, as they rapidly vary not only in size and position, but also in composition, some yielding lines which are not found in others. May not the sun-spots, those dark depressions in the solar envelope, have some connection with this new-found phenomenon?—

Lippincott's Magazine.

THE COMING ECLIPSE.

A total eclipse of the sun is not only one of the most imposing spectacles of nature, but also one of the most important of astronomical phenomena. Although such an eclipse occurs nearly every year somewhere on the earth, yet the area within which it can be observed is so small that it happens to few persons to witness one in the course of a lifetime. There have been only two that were visible in any large part of the United States since the beginning of the present century, namely, those of 1806 and of 1834. Hence, a total eclipse, whose path lies through a large and thickly settled portion of our country, is an event whose interest cannot be exaggerated. Such an eclipse will take place in the United States on the afternoon of August 7th. It will be seen as partial all over the country, and as total throughout Iowa, Central Illinois, Southern Indiana, Kentucky, and North Carolina. Moreover, as the sun will be nearly at its greatest distance from the earth, and the moon at its least, the obscuration will last a longer time than usual.

The chief points of popular interest in a total solar eclipse, and those also that can be seen by the naked eye, are as follows:

1. The change in the color of the sky and clouds, and in the colors and shades of the distant landscape, and also of near objects. 2. The approach and retreat of the *dark shadow*, which may be stated approximately to be at the rate of a mile a second. 3. The degree of darkness during the totality, its effect upon animals and plants, and whether stars can be seen; and if so, how many, what stars and of what color. 4. The *corona*, or halo of light, which surrounds the moon, and which usually appears three or four seconds previous to the total extinction of the sun's light, and continues visible for about the same interval after

its reappearance. In general, it may be compared to the nimbus commonly painted around the heads of the saints. To the naked eye, the corona appears to start out from the dark body of the moon just at the moment of total eclipse. It is the most startling and impressive incident of the eclipse,—the climax of the whole phenomenon,—and perhaps the most thrilling effect in nature. 5. *The rose-colored projections*, which appear around the margin of the moon's disk, are often (though not always) visible even to the naked eye. 6. The *sphericity* of the moon, which has cometimes been seen projected upon the bright sky; also the effect of the moon's *hanging out in the sky* between the earth and the sun, and sometimes apparently very near the former. 7. The moments of the four contacts should be noted by all who have even small glasses, and who can obtain the correct time, and should be communicated to Professor Stephen Alexander, of Princeton, N. J., who is the chairman of the Committee on this eclipse, appointed by the National Academy of Sciences. For a full list of points to be observed, see an elaborate paper by the same gentleman in the Coast Survey Report for 1860.

Solar eclipses always begin on the west side of the sun, and terminate on the east side; that is, the moon moves over the sun from west to east. The whole duration of a total eclipse is about two hours, and that of the total phase two or three minutes, more or less. There is no premonition of a solar eclipse; the moon (whose dark side is toward us) being invisible in the intensely brilliant beams of the adjacent sun, until her eastern limb (or rim) actually touches his western limb. After a half an hour, if the sky be clear, the light begins to alter. Gradually the cheerful and vigorous brilliancy of the summer will seem to change into something like the feeble and ineffectual radiance occasionally noticeable in winter. Mrs. Airy, wife of the Astronomer Royal, who was one of her husband's party in Spain, thus describes a still deeper phase of an eclipse: "A gloominess gradually crept over the whole scene as if a storm was coming on. The southern mountains beyond the Ebro began to stand up strangely black. Then a sickly green hue overspread the whole nearer landscape. A peculiarly mournful sighing wind, cold and strong, began to rise, as if from among the large, old trees beneath us on the north side of the hill. The butterflies disappeared, but the swift continued on the wing. These appearances grew more and more intense, and all 'instructions' were totally forgotten in the excitement of the moment. It became very cold, and I was glad to wrap myself in a large Scotch plaid."

Half a minute before totality, Lieutenant Gillis speaks of seeing the purplish-black moon "for the first time in my life in its true form, —a sphere and not a disk. At the moment of totality, beads of golden and and ruby-colored light flashed almost entirely round the moon." This flickering band broke up suddenly, and rose-colored protuberances attracted Lieutenant Gillis's attention so strongly that he forgot the corona, and lost the beat of the chronometer. Indeed, the most experienced observers are often thrown off their guard at the moment of inner contact. Thus, Mr. Baily says of the eclipse of 1842: "I had noted down, on paper, the time of my chronometer, and was in the act of counting the seconds in order to ascertain the time of inner contact, when I was astounded by a tremendous burst of applause from the streets below, and at the *same moment* was electrified at the sight of one of the most brilliant and splendid phenomena that can well be imagined. For, at that instant, the dark body of the moon was suddenly surrounded with a corona, or kind of bright glory, similar in shape and relative magnitude to that which painters draw round the heads of saints, and which by the French is designated an *aureole*. Pavia contains many thousand inhabitants, the major part of whom were at this early hour walking about the streets and squares, or looking out of windows, in order to witness this long-talked-of phenomenon; and when the total obscuration took place, which was *instantaneous*, there was an universal shout from every observer, which 'made the welkin ring'; and for the moment withdrew my attention from the object with which I was immediately occupied." The observers of the eclipse of 1860, in Labrador, saw "the dark shadow advance from the west with a frightful rapidity, and then pass over. It looked like a dark column of very dark cloud. The tint of the sky during the totality was of an intense blue. The dark moon appeared to hang out in space between us and the sun. A gloomy, unearthly light fell upon all objects, impressing one with the idea that some fearful calamity was about to happen. The wind, which had been blowing in gusts, now sank, and a death-like stillness prevailed. A little solitary bird poured forth a melancholy song, and then the stillness appeared even greater than before. Capella and other stars were seen."

In Spain, just before the totality, Mr. Airy saw through the telescope, "while the white sun was still shining, two red prominences of great splendor, and one double floating red

cloud. The white corona formed round the moon all at once; and the moon was seen complete, with the dazzling sun, brilliant corona, and brilliant prominences." To the naked eye, however, the crescent had diminished to a thread. "The gloom," continues Mr. Airy, "was everywhere intense. I was particularly struck with the moaning of the wind among the old forest-trees beneath me. The swifts had disappeared. A deeper gloom filled the sky in the north-west, and came rapidly on. The moment of totality had come; the whole air was at once filled with darkness, and yet it was darkness through which mountain and valley could be distinctly seen. For a moment we seemed to be in the midst of a streaky shower of smoke or fine dust, which, however, was perfectly clear, and which could not be felt. The range of southern hills was of an inky black, while the sky beyond them was an intense golden orange. My shadow on the ground was quite black and sharp, as in the clearest moonlight. The corona was a bright radiating glory, its appearance made very singular from the projection of four or five brilliant beams at about equal intervals, far beyond the width of all the rest. I could not, with the unarmed eye, see the red prominences." At the reappearance of the sun "we saw the dark shadow distinctly sweeping away along the valley to the south-east, a path of darkness, and the clear daylight breaking out behind it." The darkness of a total eclipse is doubtless similar both in tint and degree to that of a very heavy thunder-storm.

Atlantic Almanac.

THE ECONOMY OF LOW SALARIES.

While a too lavish expenditure of the public money must always receive the unqualified condemnation of all prudent and right-thinking men, a system of economy that takes in view only the present moment, or is measured solely by the number of dollars and cents expended, regardless of other, perhaps weightier considerations, is certainly not free from objections. In the daily transactions of domestic life it is well understood that the lowest priced articles are not always the cheapest when durability, utility, and other qualities are considered. This holds likewise in the administration of public affairs. The smallest expenditure does not always show the truest economy. On the contrary, a penurious outlay must often be condemned as narrow-minded and unwise. This, we think, is the case with the practice still far too generally followed, of employing teachers of a low grade of qualifications, simply because they can be had *cheap*, or rather of driving away those well qualified, by offering such a miserable pittance for their services as will barely suffice to cover necessary current expenses. The common school system is sometimes opposed on the ground of the inefficiency of our schools. We grant that our common schools are, in many cases, not what they should be, and even where furthest advanced they may still be far from perfect. But the question arises, is it the system, or an erroneous or short-sighted administration of the system, to which is chargeable this want of efficiency? The true policy of improving the schools is to improve the teachers. But what inducement, do school directors hold out to young men and women to qualify themselves for teaching, or to such as have qualified themselves, to remain in the profession, so long as other, perhaps less onerous vocations, everywhere, invite them to more lucrative employment.

Not until salaries are offered sufficiently liberal to warrant teachers to qualify themselves properly, and to induce them when thus qualified to make teaching their permanent business, can we hope to see our schools attain the highest efficiency. Low wages, poor teachers, and poor schools most generally go together.

To show that we are not alone in these views we present a few extracts from the "School Report" for 1867. Under the head of "Obstacles in the way of improvement," Mr. Sheely, superintendent of Adams county, has the following: "I am always in favor of true economy in public as well as in private affairs; but the payment of wages so low that none but the most ordinary teachers can afford to teach, is *poor economy*. It is downright folly, to say the least; it is penny wise and pound foolish; it is simply driving from us and from the profession, those whose services we can least afford to lose, and employing in their stead those whose services as teachers are dear at any price. Directors cannot more speedily or more effectually cripple the schools and break down the system, than by continuing in their present course. Within the last two years over thirty per cent. of our best teachers have either quit the profession or left the county, simply because they could do better otherwise and elsewhere. There are districts in the county much more liberal than others in this respect, and, as a general thing, they have the best teachers. Teachers, like other mortals, do for themselves the best they can, and go where their services are best rewarded. If one locality or one kind of employment does not afford men a livelihood, they are perfectly

justifiable in going elsewhere, or engaging in something that does."

After a tabular statement Mr. Sheely adds: "I make these comparisons, and present these figures, not for the benefit of teachers, who already know the facts, but for the information of directors in particular, and the public in general, so that all may know not only what embarrassments and difficulties we have to contend with, but why it is that our schools do not improve more rapidly. Let the truth be known, and let the blame be put where it properly belongs, and not upon the superintendent, or upon our noble school system."

Mr. Persons, Superintendent of Crawford county, recommends "a more liberal compensation of teachers" as a means of improving the schools. He says: "Although this measure has often been presented, and urged, there is still need of again calling attention to the subject. To be sure this will incur additional expense, but we believe that the best interests of the schools, and justice to our teachers, as well as the *soundest economy* in the expenditure of the public moneys, all demand a more liberal policy in this respect. For nearly all the evils alluded to under the head of 'teachers,' this is the proper remedy." "There is nothing for which the people should be so willing to make sacrifices, or for which they *can afford* to pay so liberally as *education;* and experience has shown that wherever a district or county have been noted for paying *good wages*, there have the teachers been likewise noted for their liberal culture, professional skill, and earnest devotion to their work and their schools remarkable for excellence."

In the report of N. B. Critchfield, Superintendent of Somerset, we find the following: "If we could pay our teachers better salaries they would qualify themselves more thoroughly for their work. Many of our best teachers are driven from the profession every year, because there are greater inducements offered in other callings. We need a body of well-qualified and experienced teachers, who will continue in the profession, and not make the business of teaching a mere stepping-stone to some other more lucrative employment. To secure this end, teachers must be allowed sufficient compensation to enable them to provide for their own comfort and the comfort of those depending upon them for support."

Much more might be presented to the same effect, but we content ourselves with these extracts, trusting that the observations made may commend themselves to the good sense of directors, and that they may find it consistent with their duty and their ideas of *true economy* to make a general and liberal advance in this respect the current year.—*Pottsville Standard.*

THE REIGN OF ARCHELAUS.

Herod's massacre had after all a certain mercy in it; there were no lingering tortures. The slayers of children went about with naked and bloody swords, which mothers could see, and might at least make effort to flee from. Into Rachel's refusal to be comforted need enter no bitter agonies of remorse. But Herod's death, it seems, did not make Judea a safe place for babies. When Joseph "heard that Archelaus did reign in the room of his father Herod, he was afraid to return thither with the infant Jesus," and only after repeated commands and warnings from God would he venture as far as into Nazareth. The reign of Archelaus is not yet over; he has had many names, and ruled over more and more countries, but the spirit of his father, Herod, is still in him. To-day his power is at its zenith. He is called Education; and the safest place for the dear, holy children is still Egypt, or some other of the fortunate countries called unenlightened.

Some years ago there were symptoms of a strong rebellion against his tyranny. Horace Mann lifted up his strong hands and voice against it; physicians and physiologists came out gravely and earnestly, and fortified their positions with statistics from which there was no appeal. Thomas Wentworth Higginson, whose words have, with the light, graceful beauty of the Damascus blade, its swift sureness in cleaving to the heart of things, wrote an article in the *Atlantic Monthly* called "The Murder of the Innocents," which we wish could be put into every house in the United States. Some changes in school organizations resulted from these protests; in the matter of ventilation of school-rooms some real improvement was probably effected; though we shudder to think how much room remains for further improvement, when we read in the report of the superintendent of public schools in Brooklyn that in the primary departments of the grammar schools "an average daily number of 33,275 pupils are crowded into one-half the space provided in the upper departments for an average daily attendance of 26,359; or compelled to occupy badly-lighted, inconvenient, and ill-ventilated galleries, or rooms in the basement stories."

But in regard to the number of hours of confinement, and amount of study required of children, it is hard to believe that schools have ever been much more murderously exacting than now.

The substitution of the single session of five hours for the old arrangement of two sessions of three hours each, with a two-hours interval at noon, was regarded as a great gain. So it would be, if all the brain-work required for the day were done in that time; but in most schools, with the five-hours session, there is next to no provision for studying in school-hours, and the pupils are required to learn two, three, or four lessons at home. Now, when is your boy to learn these lessons? Not in the morning, before school; that is plain. School ends at two. Few children live sufficiently near their schools to get home to dinner before half past two o'clock. We say nothing of the undesirableness of taking the hearty meal of the day immediately after five hours of mental fatigue; it is probably a less evil than the late dinner at six, and we are in a region where we are grateful for *less* evils! Dinner is over at quarter past three; we make close estimates. In winter there is left less than two hours before dark. This is all the time he is to have for out-door play; two hours and a half (counting in his recess) out of twenty-four. Ask any farmer, even the stupidest, how well his colt or his lamb would grow if it had but two hours a day of absolute freedom and exercise in the open air, and that in the dark and the chill of a late afternoon! In spite of the dark and the chill, however, your boy skates or slides on until he is called in by you, who, if you are an American mother, care a great deal more than he does for the bad marks which will stand on his week's report if those three lessons are not learned before bed-time. He is tired and cold; he does not want to study—who would? It is six o'clock before he is fairly at it You work harder than he does, and in half an hour one lesson is learned; then comes tea. After tea half an hour, or perhaps an hour, remains before bed-time; in this time, which ought to be spent in light, cheerful talk or play, the rest of the lessons must be learned. He is sleepy and discouraged. Words which in the freshness of the morning he would have learned in a very few moments with ease, it is now simply out of his power to commit. You, if you are not superhuman, grow impatient. At eight o'clock he goes to bed, his brain excited and wearied, in no condition for healthful sleep; and his heart oppressed with the fear of "missing" in the next day's recitations. And this is one out of the school-year's two hundred and sixteen days—all of which will be like this, or worse. One of the most pitiful sights we have seen for months was, a few weeks since, a little group of four dear children, gathered round the library lamp, trying to learn the next day's lesson in time to have a story read to them before going to bed. They had taken the precaution to learn one immediately after dinner, before going out, cutting their out-door play down by half an hour. The two elder were learning a long spelling-lesson; the third was grappling with geographical definitions of capes, promontories, etc.; and the youngest was at work on his primer. In spite of all their efforts, bed-time came before the lessons were learned. The little geography student had been nodding over her book for some minutes, and she had the philosophy to say, "I don't care; I'm so sleepy. I had rather go to bed than hear any kind of a story." But the elder ones were grieved and unhappy, and said, "There won't *ever* be any time; we shall have just so much more to learn to-morrow night." The next morning, however, was a sight still more pitiful: the baby of seven, with a little bit of paper and a pencil, and three sums in addition to be done, and the father vainly endeavoring to explain them to him in the hurried moments before breakfast. It would be easy to show how fatal to all real mental development, how false to all Nature's laws of growth, such a system must be; but that belongs to another side of the question. We speak now simply of the effect of it on the body; and here we quote largely from the admirable article of Col. Higginson's, above referred to. No stronger, more conclusive words can be written:

"Sir Walter Scott, according to Carlyle, was the only perfectly healthy literary man who ever lived. He gave it as his deliberate opinion, in conversation with Basil Hall, that five and a half hours form the limit of healthful mental labor for a mature person. 'This I reckon very good work for a man,' he said. 'I can very seldom work six hours a day.' Supposing his estimate to be correct, and five and a half hours the reasonable limit for the day's work of a mature intellect, it is evident that even this must be altogether too much for an immature one. 'To suppose the youthful brain,' says the recent admirable report, by Dr. Ray, of the Providence Insane Hospital, 'to be capable of an amount of work which is considered an ample allowance to an adult brain is simply absurd.' 'It would be wrong, therefore, to deduct less than a half hour from Scott's estimate, for even the oldest pupils in our highest schools, leaving five hours as the limit of real mental effort for them, and reducing this for all younger pupils very much further.'

"But Scott is not the only authority in the

case; let us ask the physiologists. So said Horace Mann before us, in the days when the Massachusetts school system was in process of formation. He asked the physicians in 1840, and in his report printed the answers of three of the most eminent. The late Dr. Woodward, of Worcester, promptly said that children under eight should never be confined more than one hour at a time, nor more than four hours a day.

"Dr. James Jackson, of Boston, allowed the children four hours' schooling in winter and five in summer, but only one hour at a time; and heartily expressed his detestation of giving young children lessons to learn at home.

"Dr. S. G. Howe, reasoning elaborately on the whole subject, said that children under eight years of age should never be confined more than half an hour at a time; by following which rule, with long recesses, they can study four hours daily. Children between eight and fourteen should not be confined more than three-quarters of an hour at a time, having the last quarter of each hour for exercise on the play-ground.

"Indeed, the one thing about which doctors do not disagree is the destructive effect of premature or excessive mental labor. I can quote you medical authority for and against every maxim of dietetics beyond the very simplest; but I defy you to find one man who ever begged, borrowed, or stole the title of M. D. and yet abused those two honorary letters by asserting under their cover that a child could safely study as much as a man, or that a man could safely study more than six hours a day.

"The worst danger of it is that the moral is written at the end of the fable, not at the beginning. The organization in youth is so dangerously elastic that the result of these intellectual excesses is not seen until years after. When some young girl incurs spinal disease from some slight fall, which she ought not to have felt for an hour, or some business man breaks down in the prime of his years from some trifling over-anxiety, which should have left no trace behind, the popular verdict may be 'Mysterious Providence;' but the wiser observer sees the retribution for the folly of those misspent days which enfeebled the childish constitution instead of ripening it. One of the most striking passages in the report of Dr. Ray, before mentioned, is that in which he explains that, 'though study at school is rarely the immediate cause of insanity, it is the most frequent of its ulterior causes except hereditary tendencies.' *It diminishes the conservative power of the animal economy to such a degree that attacks of disease which otherwise would have passed off safely destroy life almost before danger is anticipated.*"

It would be easy to multiply authorities on these points. It is hard to stop. But the limits of a newspaper article forbid anything like a full treatment of the subject. Yet, when the newspaper speaks to its 250,000, its voice on this vital question ought never to cease in the land until a reform is brought about. Teachers are to blame only in part for the present wrong state of things. They are to blame for yielding, for acquiescing; but the real blame rests on parents. Here and there, individual fathers and mothers, taught, perhaps by heart-rending experience, try to make stand against the current of false ambitions and unhealthy standards. But these are rare exceptions. Parents, as a class, not only help on but create the pressure to which teachers yield and children are sacrificed. The whole responsibility is really theirs. They have in their hands the power to regulate the whole school routine to which their children are to be subjected. This is plain, when we once consider what would be the immediate effect in any community, large or small, if an influential majority of parents took action together, and persistently refused to allow any child under fourteen to be confined in school more than four hours out of the twenty-four, more than one hour at a time, or do more than five hours' brain-work in a day. The law of supply and demand is a first principle. In three months the schools in that community would be entirely reorganized, to accord with the parents' wishes; in three years the improved average health of the children in that community would bear its own witness in ruddy bloom along the streets; and perhaps even in one generation so great gain of vigor might be made that the melancholy statistics of burial would no longer have to record the death under twelve years of age of more than two-fifths of the children who are born.—*Cor. N. Y. Independent.*

TOTAL ECLIPSE OF AUGUST 7th, '69.

BY PROF. GUSTAVUS FISHER.

Total eclipses of the sun, for a given locality on earth, are of a very rare occurrence. Thus, in London, not a single total eclipse of the sun happened between 1140 and 1715: that is, in a space of five hundred and seventy-five years. In Paris, only one eclipse occurred in the whole of the eighteenth century, while during the nineteenth century not one has happened or will happen in that locality.

Total eclipses of the sun can last no longer than seven minutes and fifty-eight seconds.

The greatest possible duration happens only when the centers of sun, moon, and earth lie exactly in a straight line, and at the same time the sun is at his greatest distance (apogee) and the moon at her least distance (perigee) from the earth; and even then the duration of seven minutes and fifty-eight seconds obtains only on the equator. A coincidence of these conditions has not happened since the creation of man.

The observations which are made in eclipses of the sun may be divided into two kinds: first, those which refer to the time of the motions of earth and moon; and second, those which refer to the nature of the sunlight. In regard to the former, we remark here that *every* eclipse of the sun will serve for a correction of the *elements of the orbits*. The time when the moon enters the disk of the sun, the duration of the eclipse, and the time when the last trace of the moon leaves the edge of the sun, have been calculated beforehand with the utmost minuteness, even for the twentieth part of a second, thanks to the accurate knowledge which our astronomers have of the motions of the earth, and of the infinitely more complicated motions of the moon. Now, if the mentioned phenomena happen exactly at the time calculated, they evidently confirm the correctness of the calculations, and of the supposed motions and distances of these heavenly bodies. But if there is a discrepancy, even of the twentieth part of a second, the previous calculations must be corrected, and thus every new observation will furnish either a new proof of the absolute correctness of the astronomical calculations, or lead to corrections which finally must approximate this part of astronomical knowledge to a state of absolute perfection.

But by far the most important part of the observations which will be made in this eclipse refer to the *nature of the sunlight*. There is a very widely spread opinion that in a total eclipse of the sun a total darkness prevails, and that the stars become visible. This opinion, though repeated by our astronomical handbooks, is entirely erroneous. Only the very brightest stars become visible. Thus, in the total eclipse of July 18, 1860, the four planets, Mercury, Venus, Jupiter, and Saturn were seen near the sun with the naked eye, and in the total eclipse of July 28th, 1851, in Dantzic, Mercury, Venus, Jupiter, Procyon, Regulus, and Spica were visible; but it was in vain that Galle tried to find Castor and Pollux. The fact that during a total eclipse there is only a twilight, but by no means darkness, is easily explained, when we consider that the atmosphere in places next to the total eclipse will *reflect* the sunlight in all directions, and that by this reflected light those parts of the atmosphere which lie within the total eclipse are illuminated, though feebly. There is no doubt that in the present eclipse the amount of reflected light present in every part of the eclipsed zone will be accurately and most minutely measured, to judge from the high perfection of the photometric instruments which are placed at the disposal of the observing astronomers.

But there is another phenomenon which, in the moment of the total eclipse, is presented to the eyes of the observers, so glorious and wonderful that no description can give an adequate idea of it. This is the corona, which suddenly appears in the moment when the last ray of the sun disappears behind the deep black cover of the moon: a shining wreath of beams, surrounding the totally eclipsed sun to a distance of about one-third of the apparent diameter of the moon, and so bright at its inner edge that we may doubt whether really the whole sun is obscured, and then fading away imperceptibly in the vast space of heaven. The corona does not always present the same appearance; it is either of a silvery white or of a reddish tinge, according to the state of our atmosphere, and sometimes colored rays or pencils of light are seen issuing from it. The halo with which painters surround the heads of saints gives, perhaps, the best idea of it. It disappears with the first reappearing ray of the sun, as if by magic.

What is the cause of this phenomenon? It must be either in the sun or in the moon. The moon could produce it only if she had an atmosphere capable of refracting the rays of the sun. But since it has been proved that the moon is without an atmosphere, it follows that the cause of the phenomenon must be found in the sun itself.

The following theory was adopted by the best astronomers before the discovery of the spectrum analysis:

If we observe the sun through a good telescope, we see black spots on its surface, irregularly formed, and surrounded with a penumbra, that is, an inner ring, which is less dark, and of an ashy-gray color. These spots often combine into a single larger spot, or separate into different smaller ones, passing over the disk from east to west in periods of nearly two weeks. Sir W. Herschel, and after him most astronomers, believed these spots to be openings in a luminous atmosphere of the sun, which alone is the cause of the sunlight, and that the sun, whose body these very openings allow us to see, is dark; that this luminous atmosphere (photosphere) is separated from the body of the

sun by an inner atmosphere, tending to intercept or to soften the heat and light of the photosphere, and that the penumbra is produced by this inner atmosphere.

But there are several important objections against this theory. Thus it has been observed that the spots, although moving around the surface of the sun nevertheless retain their shapes often for a long time. But by Sporer's investigations it has been proved that the surface of the sun is perpetually agitated by the most violent and tremendous storms, moving near the equator in a westerly, in higher latitudes in an easterly direction. But how can the spots, if mere interruptions of a gaseous atmosphere, retain their shape, when this atmosphere itself is driven over many thousands of miles in the most violent convulsion? Again: several astronomers have observed that both the spots and their penumbras are traversed by streaks and veins of sunlight. W. Carrington, in Redhill, saw on the first of September, 1859, an intense white light, brighter than that on the surface of the sun, suddenly emerging from the center of a large spot. The phenomenon lasted five minutes, and after its disappearance the spot remained unchanged. The same astronomer inspected some days later the photographic magnetic records in Kew, in respect to declination, inclination, and intensity, and found in each of these the traces of a vast disturbance, which had occurred exactly at the time of the phenomenon described above. In 1862, the astronomer Nasmyth stated that he had observed in the penumbra of the solar spots, things looking like willow leaves, which placed themselves over each other like bridges over bridges. In 1863 other astronomers observed the willow leaves of Nasmyth, and ventured to assert—especially Sir John Herschel—that they might be living beings, developing light and electricity. Even the earth was affected by this phenomenon, for at all observatories magnetic storms were observed, all telegraph wires were overloaded, and an aurora borealis trembled on the sky.

It is evident that the hypothesis which we have stated in regard to the solar spots is unable to explain any of these phenomena. Much less can the appearance of the corona be explained by it. In order to account for the corona astronomers have resorted to a new hypothesis; the existence of a *third* atmosphere around the sun—a cloudy sphere. This sphere, they say, is invisible under ordinary circumstances, in consequence of the brighter photosphere; but during a total eclipse it will appear as corona, either with its own light or by reflecting the rays of the photosphere.

But the corona is not the only, nor even the most remarkable phenomenon of a solar eclipse. For at the moment when the last ray of light has vanished, we suddenly behold on the edge of the dark moon strange conglomerations of a pale reddish lustre, which some observers have compared to glaciers, illuminated by the rising or setting sun, others to reddish mountain peaks, others to immovable flames. These protuberances—so they are called—are not always connected with the edge of the moon or the sun, but often are separated from it by a considerable distance (up to two and a half minutes.) Some, when the moon is about to glide over them, suddenly change their colors, or seem to grow in height, and then new protuberances will make their appearance. These protuberances have especially been seen near those places on the edge, where solar spots have been perceived before the obscuration.

These protuberances were several times observed during the last century, first in 1733 by Bassemius in Gothenburg. But they did not engage the attention which they deserved till Schumacher made his admirable observations in Vienna on the eighth of July, 1842; since that time they have been observed by all astronomers with the most minute care during all total eclipses—in 1850 in Honolulu, 1851 in Sweden and Prussia, 1858 in Peru and Brazil, 1860 in Spain. It is for the sake of getting photographic likenesses of the protuberances and the corona that numerous astronomers who have resorted to the scene of the present eclipse have provided themselves with photographic instruments, which, by the skill of Warren de la Rue and Secchi, produced surprising results at the occasion of the last eclipse.

Some astronomers think that the protuberances bear the same relation to the outer or cloudy atmosphere of the sun, as the terrestrial clouds do to our atmosphere. Others consider them as volcanic masses, formed in or below the photosphere, which have penetrated through the openings that appear as solar spots, and perhaps have caused these openings. Others suppose them to be optical phenomena produced by the refraction of light. Some have even considered them as real mountains, which, however, according to their apparent size, would have a height of about two hundred miles, if they were on the moon, and of about sixty thousand miles if on the sun.

All these problems have entered a new phase since Bunsen and Kirchhoff, ten years ago, discovered the analysis of the spectrum. We will endeavor to give the reader a brief outline of this splendid discovery, one of the most im-

portant of this century, and especially designed to revolutionize the science of chemistry.

Newton discovered that if a beam of solar light be admitted to a dark room through a small aperture, and intercepted by a triangular glass prism, the rays of the sun will be dispersed into an oblong, colored figure, which—especially when observed through a telescope—looks like a piece cut from a rainbow, with the known succession of the seven colors, viz., red, orange, yellow, green, blue, indigo, violet. This figure is called the prismatic solar spectrum. The spectra of the planets, but not those of the fixed stars, show exactly the same succession of colors. In the year 1814 Frauenhofer found that the colors of the solar spectrum are not exactly contiguous, but separated by a number of black parallel lines, which are vertical to the length of the spectrum. These lines, whose number is now known to be nearly two thousand, always appear exactly at the same places of the spectrum, however much the angle of the prism may be altered, so that we may consider them as the regular borders of the several groups and shades of colors.

Scientists were in the dark concerning the origin and nature of these lines, until recent peculiar discoveries shed an unexpected light on the subject. These discoveries were made by comparing spectra not having their origin in the sunlight. Thus it was found that in the spectrum of chloride of sodium (common salt) the colors appear much darkened, with a very bright yellow line at the place where the red color changes into orange. This yellow line is a characteristic proof of the presence of sodium in any body in a state of combustion. Electric light does not show any dark lines in the spectrum at all. But if a flame of alcohol, the wick being saturated with sodium, is interposed between the prism and the electric light, a dark line will appear in the place of the bright yellow line. Now Bunsen and Kirchoff discovered that the mentioned dark line exactly coincides with one of the lines of Frauenhofer in the solar spectrum, and that the same phenomenon is repeated in innumerable other cases. To each chemical element, treated in this way, corresponds a dark line, or a series of dark lines; and if several elements are combined, the corresponding dark lines appear separated without the slightest confusion.

By this discovery an entirely new way of chemical analysis was found. By means of the spectrum may be recognized the presence of the very minutest particles of elements in terrestrial bodies, particles so minute that by no other method can even a remote approximation to this delicacy be obtained. Thus, the spectrum analysis has disclosed the presence of *one trillionth* of a pound of sodium by means of the characteristic yellow line in the spectrum. We may imagine how enormous will be the result of Bunsen and Kirchhoff's discovery in chemical science. But it is hardly of less importance in astronomy. For the same scholars also made the discovery that there is an essential difference between the spectra of solid and liquid and those of gaseous bodies. Solid or liquid bodies brought to a state of white heat produce a *continuous* spectrum, in which all the colors are contained without the interposition of dark lines. But gaseous bodies produce bright lines interrupted by dark intervals. Now, when the flame of a gaseous body is interposed between the prism and a white hot solid or liquid body, the spectrum of the latter at once receives the dark lines of Frauenhofer exactly at the places where the spectrum of the gaseous body has shown the bright lines, while the dark intervals of the latter coincide with the colors of the spectrum.

The inferences which may be made from these facts are palpable. For it evidently follows that the sun must be a white hot solid or liquid body, surrounded by a gaseous atmosphere, in which a number of elements, some of which are also found on our earth, are in a state of combustion. The body of the sun without this atmosphere would produce a spectrum without black lines. But since we see in the solar spectrum a number of black lines corresponding to the spectra of certain terrestrial bodies, as iron, chromium, nickel, zinc, etc., it follows that these bodies must be present on the surface of the sun, and must be in a state of combustion in his atmosphere. On the other hand, some terrestrial elements, as gold, silver, quicksilver, etc., can not be present on the surface of the sun, since the lines formed by their spectra are not formed in the spectrum of the sun. Many experiments have also been made, consisting of the artificial production of new lines in the solar spectrum. Thus, for instance, we find in the spectrum of *lithium* a peculiar red line. If we interpose a lithium flame between a sunbeam and a prism, a dark line will appear on the same place where before the red lithium line was found, and which did not exist before in the spectrum of the sun. We infer from this that lithium is *not* contained in the surface of the sun.

We may now explain the solar spots, the protuberances, and the corona. The solar spots are most probably identical with the protuberances, and both are nothing but clouds, swimming in the atmosphere of the sun, similar to our clouds, which so often appear on the dis-

tant horizon, as fantastic formations, like the protuberances. The corona is nothing but this very atmosphere of the sun, of which, under ordinary circumstances, we can not see anything, since its light is too weak to be perceived next to the intense light of the sun.

Thus the great importance of the solar eclipse of the seventh of August may easily be estimated. For since its duration is longer by several minutes than that of most others, it is to be hoped that an accurate spectrum of the corona may be obtained, and that in it may be observed the bright lines which are produced by the burning gases of its elements. These results will be secured provided the spectrum so obtained is bright enough to show its different lines with accuracy, which, though a probability, is by no means a certainty.

Perhaps some light may also be shed on the problem of the so-called invisible colors of the spectrum. For, once knowing that the solar spectrum is composed of two elements, which it has hitherto been possible to observe only in their combination, we can not tell what results may be in store for us if we are once permitted to contemplate the one of these elements separated from the other.

We have spoken here only of the importance of the spectrum analysis in regard to a more accurate knowledge of the *sun*. But we may remark that the spectrum analysis is just beginning to enlarge our knowledge of the other stars in an entirely unexpected manner. Thus, we know that in nearly all stars several of the elements of the sun must be present, as, for instance, iron, sodium, magnesium, hydrogen. But there appears also a difference. Thus, in the brightest star of Orion no hydrogen exists, while in Aldebaran the presence of quicksilver is certain, which is wanting in the sun. In the spectrum of Sirius lines have been found which can not be produced by any known terrestrial body. We know, at the same time, by the most recent discoveries, that the planetary nebulæ can not be clusters of stars, as Sir John Herschel thought to have proved by Rosse's large reflecting telescope, but immense masses of gas without a nucleus; for their spectra do not show dark lines on a bright ground, but bright lines with dark intervals.

What progress of science! How long ago is it that we learned to measure the heavenly bodies? Scarcely a quarter of a century have we known how to find their distances, and not much longer that we have known how to weigh them, as though we could place them in a scale. Now we discover the matter of which they are made—the metals which lie on their surface. We decompose them as if we held them in our hands—had placed particles of them in the alembics of our laboratories.

American Ed. Monthly.

Excellent Advice.—Dr. Samuel Johnson was much attached to a young man, an intelligent Italian. As the Doctor lay upon the couch from which he never rose up, he called his young friend to him, and tenderly and solemnly said: "There is no one who has shown me more attention than you have done; and it is now right that you should claim some attention from me. You are a young man, and are to struggle through life; you are in a profession that I dare say you will exercise with great fidelity and innocence; but let me exhort you always to think of my situation, which must one day be yours—always remember that life is short, and that eternity never ends."

Mental and Manual Labor.—Professor Houghton, of Trinity College, has published some curious chemical computations respecting the relative amounts of physical exhaustion induced by manual and mental labor. According to these chemical estimates, two hours of severe mental study abstracts from the human system as much vital strength as is taken from it by an entire day of mere hand-work. This fact, which seems to rest upon strictly scientific laws, shows that the men who do brain-work should be careful, first, not to overtask the system by continuous exertion; and, secondly, that they should not omit to take physical exercise on a part of each day sufficient to restore the equilibrium between the nervous and muscular systems.—*Medical and Surgical Reporter.*

When I walk in the woods, I am reminded that a wise purveyor has been there before me; my most delicate experience is typified there. I am struck with the pleasing friendships and unanimities of nature, as when the lichens on the trees take the form of their leaves. In the most stupendous scenes you will see delicate and fragile features, as slight wreaths of vapor, dew-lines, feathery sprays, which suggest a high refinement, a noble blood and breeding, as it were. It is not hard to account for elves and fairies; they represent this light grace, this etherial gentility. Bring a spray from the wood or a crystal from the brook, and place it on your mantel, and your household ornaments will seem plebeian beside its nobler fashion and bearing. It will wave superior there, as if used to a more refined and polished circle. It has a salute and a response to all your enthusiasm and heroism. *Thoreau.*